Using Guided Case-Based Learning to Foster
Social Work Students'
Child Welfare Assessment Skills

Effects of Adaptable Computer-Supported Scripts
and Metacognitive-Reflection Prompts.

Vorgelegt von

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Preamble

The manuscript of the first study of this doctoral thesis, entitled "Teaching Students to perform Child Welfare Assessments with Adaptable Computer-Supported Scripts and Metacognitive Reflection Prompts", was accepted for publication in the Journal of Social Work Education on March 17th, 2023. The manuscript of the second study, entitled "Social Work Students' Reflection about conducting Child Welfare Assessment in a Guided Case-Based Learning Environment", was submitted for publication in Social Work Education on May 11th, 2023. These two articles were first authored by Mary Opio-Göres. Co-authors provided feedback based on which revisions were made. To ensure accuracy, the printed journal articles should be used as references rather than the manuscripts presented in this dissertation.

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This journey was inspired by many female mentors, alive and departed. I dedicate this dissertation to my mum and my lovely daughters, Jahla and Elani.

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Abbreviation list

CBL   Case-based learning

CBR   Case-based reasoning

CSS   Computer-supported scripts

GCBBL   Guided cased-based learning

UNCBL   Unguided cased-based learning

Extended Summary

Preparing students for child protection practice is a challenge in social work education. Exploring ways of equipping them with relevant skills and knowledge for assessment is an ongoing endeavour. One target of social work education is to enable students engage in high-quality assessment processes, learning how to evaluate different sources of information systematically and critically. A variety of instructional approaches have been employed to teach about the assessment of child welfare cases, including case-based learning. In this approach, so-called "cases" are used to introduce students to a wide range of scenarios, most likely to be encountered in a real-world.

Digital technologies broaden the range of opportunities to realize case-based learning (CBL). With digital means, it is possible to present cases in different formats like videos for example. Guiding students through their learning processes with scaffolds such as computer-supported scripts (CSS) is also possible. By breaking down complex tasks into smaller ones and showing how certain steps can be undertaken, CSS make learning about complex topics manageable. For example, students can be sequentially guided to conduct a risk assessment, reconstruct a case, or define a problem when learning about child welfare practices. However, there is a fine line between providing the right amount and too much guidance. On the one hand, scaffolds should help students perform the necessary learning activities at a higher level. On the other hand, too much guidance may have a negative impact on students' autonomy, self-regulation, and motivation. Considering these insights, a question arises as to how computer-supported scripts can be designed to provide necessary guidance while maintaining balance that they are not too rigid. Providing students with the possibility of choosing when and how they want to be supported can be a way of making scripts flexible. This way scripts are said to be "adaptable". Nonetheless, not all students might have the skills to make adjustments effectively so additional support might be warranted. Metacognitive reflection

prompts can be used to stipulate students' engagement in learning activities such as planning which might lead to better adaptation decisions.

Building on research about supporting learning process form various disciplines, this doctoral thesis had three aims: 1) to examine if offering guidance in digital case-based learning environments could help social work students acquire knowledge crucial to assessing child welfare cases, 2) to examine the effects of computer-supported scripts and metacognitive prompts on knowledge acquisition, and 3) to understand how students experience and reflect about learning in such environments. With a mixed method approach, two interconnected studies were conducted. The overall goal was to gain detailed insights into how instructional support can be used effectively to teach about child welfare assessment. A 2*2 quasi-experimental study with a control group was conducted. Data was collected from (N = 104) social work students on five different university campuses in Bavaria.

In study 1, the 1) type of computer-supported scripts (adaptable vs. strict scripts) as well as 2) type of metacognitive reflection prompts (generic vs. specific) were manipulated. In the control condition, neither prompts nor computer-supported scripts were provided. All participants were randomly assigned to one of the experimental (Guided Case-Based Learning) or a control group (Unguided Case-based Learning). In an online learning environment, students were asked, to assess four child welfare case vignettes with or without guidance.

Building on the work of Förtsch et al. (2018) three distinct types of knowledge acquisition were assessed: conceptual knowledge, strategic knowledge, and reasoning knowledge. In the post-tests, students in guided case-based learning (GCBL) environments acquired higher conceptual knowledge scores than those in unguided case-based learning (UGCBL) environments /control group. Effects of guidance on the acquisition of strategic knowledge and reasoning were marginal. There was minimal difference between students learning with an adaptable or strict CSS. Learning with the former was but not less effective than learning

with the latter. Generic prompts and adaptable scripts were found to be single-handedly effective at fostering conceptual knowledge in the post-test, but not when combined. Interestingly the intensive use of the opportunity to adapt the script was associated with conceptual knowledge acquisition. This indicated that effects of adaptable CSS might even be increased if students are effectively supported in using this option. Taking the complexity of child welfare assessments and the short duration of the study, it can be concluded that GCBL is a promising way of equipping students with knowledge crucial to the assessment of child welfare cases. In this area, further research is needed to understand how scaffolds can facilitate the congruent use of conceptual knowledge, strategic knowledge, and reasoning during child welfare assessments.

In study 2, a qualitative content analysis (Kuckartz, 2019) was conducted. Responses from N = 70 to a reflection exercise about learning in a guided case-based learning environment were analysed. Based on overarching themes, participants acknowledged the complexity of conducting child welfare assessment. They attributed perceived difficulty to a variety of factors such as limited experience in the field of child welfare assessment. Dealing with uncertainty and the ambiguous nature of information in child were also revealed to be a challenge. According to some students, the GCBL environment helped them identify areas of focus during assessments. Others, however, perceived the step-by-step breakdown of the assessment exercise as an interference with their problem-solving. This study suggests that clear instruction, opportunities for interaction, and avenues for feedback can enhance GCBL environments or students' learning experiences. Specifically, this dissertation proposes that CBL can be an effective method of teaching child welfare assessment, particularly when guidance is provided. Besides supporting the knowledge acquisition process, scaffolds like CSS and metacognitive prompts can be used to foster students' confidence in areas perceived

to be challenging. An example of these is the ability to deal with uncertainty. Research is however needed to examine suitable means of achieving this.

1. Problem Statement

Jana Müller, a social worker at the *child protection authorities,* receives the following information:

A family midwife who began working with the family during mother S.'s pregnancy is alarmed about the safety of Lillian (10 months). In a routine visit, she had seen bruises on the baby's body, especially around the legs. The baby appeared unkempt and could not stop crying. Lilian's parents reacted defensively and violently when the midwife attempted to find out what had happened. They ordered her to leave. In addition, the midwife believed both parents were intoxicated.

To work on such a case, Jana Müller should take note of the reporting midwife's credentials and obtain additional information about the family: who they are, who else is involved, and where and how they live. Müller would above all need to decide whether immediate action is necessary to protect Lillian. This could be done with the help of colleagues and based on available records like reports on prior incidents or contact with the authorities. Theoretical knowledge, for example, on symptoms and signs of abuse in minors would be necessary to critically evaluate Lillian's situation. Additionally, an understanding of the family's history, needs, and resources is crucial. Agencies like the police or family court may need to be informed, or a house visit may be required. It is worth mentioning that Jana Müllers' decisions would be based on available information and might need to be made quickly.

As presented in this case, assessments in child welfare are characterised by complexity, ambiguity, uncertainty, and fallibility (Munro, 2019; Nyathi, 2018). Yet social workers are expected to pay attention to the needs of the families and children. Using the information that they collect, and how they interpret it, they must make fair and transparent decisions based on professional judgment and understanding (Bastian & Schrödter, 2014; Helm, 2011; Horwath & Platt, 2019). On a practical side, failure in decision making, for example regarding whether

or not to intervene in cases of perceived harm, can have fatal consequences for involved social work clients and children. In this way, child protection introduces heavy demands on the reasoning skills of social workers (Munro, 2019).

It is crucial to teach social work students to engage in high-quality assessment processes that include evaluating different sources of information systematically and critically. Research shows that preparation given to students for the high demands of professional practice is often poor or, at best, only partially achieves the objective (Crisp et al., 2004; Pithouse & Scourfield, 2002). This is more so the case when it comes to equipping students with skills for dealing with uncertainties and insecurities (Effinger, 2021). Research suggests that social work educators find it challenging to facilitate learning that would foster students· competence in this area. Fengler and Taylor (2019) thus encourage social work educators to engage with innovative ways of helping students gain confidence in their knowledge and practice.

CBL has long been considered a valuable approach to teach about assessment in both live classes and digital environments (Crisp et al., 2004). With research pointing out that skills of social work can be successfully developed in online environments (Cummings et al., 2019; Wretman & Macy, 2016), digital cased-based learning can be said to be promising. Despite this, the amount of information contained in a case can be overwhelming. Learning scientists also point out that students may have difficulty working in online environments (Bannert, 2006) rendering instructional support necessary (Hmelo & Guzdial, 1996). One way of doing so is with computer-supported scripts (CSS). CSS are external scaffolds that sequence learning by showing how and when certain activities can be performed (Kollar et al., 2006). In supporting Jana Müller conduct the child welfare assessment for example, computer supported scripts can be used to 1) draw attention to identifying all key actors and how they relate to one another, 2) guide a case reconstruction by encouraging them to engage with what happened in the past and how such events contribute to the current situation, and 3) as part of the risk

assessment, encourage Jana to come up with hypotheses about possible outcomes with or without an intervention.

Providing too much support, however, which Dillenbourg (2002) refers to as "over-scripting" comes with danger of limiting students' autonomy and self-regulation. Also, too much guidance can make tasks appear unnatural. Further research has thus engaged with ways of making scripts flexible, suggesting adaptability as an option (Plass & Pawar, 2020; Wang et al., 2017). With "adaptable scripts", learners are entrusted with the task of choosing when and how they need to be supported (Vogel et al., 2022; Wang et al., 2017). Despite this, some learners may not have the skills to determine the right kind of support and the right amount of assistance they need (Daumiller & Dresel, 2019; Wang et al., 2017). To ensure effective adaptation, learners with low self-regulation skills may need additional support and this can be done with the help of metacognitive prompts (Vogel et al., 2022). These are scaffolds that encourage students to carry out activities such as planning, monitoring, or reflecting upon their learning processes (Bannert, 2006; Bannert & Reimann, 2012).

With most research on the design of learning processes being outside the field of social work, the aim of this thesis is 1) to examine if offering guidance in digital environments could support students acquire knowledge crucial to assessing child welfare cases, 2) to examine the effects of variants of support on knowledge acquisition and 3) to understand how students reflect about learning in such environments. By evaluating both learning outcomes and process data, the overall aim of this thesis was to identify elements worth paying attention to when using GCBL to teach child welfare assessment in social work education.

This dissertation is made up of three parts. The introductory section i.e., chapter 1 to 5 describes important conceptual and empirical foundations. The second section (chapters 6 and 7) presents the two empirical studies in detail. The third section (chapters 8, 9, and 10) presents a general discussion, implications of this research and a conclusion.

Chapter 2 focuses on child welfare assessments, highlighting the different definitions used in the field. Drawing on the idea that assessment is contextual and regulated by law, the concept of child protection in Germany is presented. Subsequently the complexity of child welfare assessments is explored. To underline the need for accurate and factual assessments, the connection between child welfare assessment and human reasoning is examined. Also, the use of theoretical frameworks to facilitate a systematic approach to assessment is investigated and the question of what students ought to learn about assessment is explored.

Chapter 3 introduces instructional and educational approaches to teaching child welfare assessment. Having described the case-based reasoning (CBR) cognitive model which explains problem-solving based on previous experiences, Case-Based Learning (CBL), a constructivist educational approach building on similar principles will be discussed. The role of scaffolding in CBL environments is presented. Lastly, computer-supported scripts and metacognitive are assessed as promising scaffolds for guided case-based learning.

In chapter 4, focus is drawn to mixed methods research and its potential in exploring complex learning processes. First the characteristics and advantages are evaluated. Exemplary studies using a mixed methods approach in social work education are presented. Consequences of all these insights on the research design in this thesis are finally analysed.

The first empirical study in chapter 6 examined how CBL can be used to support social work students ($N = 104$) acquire knowledge crucial to assessing cases of child welfare and whether the benefits of CBL could be maximized by structuring the learning process. Presented in Chapter 7 is the second empirical study that examined social work students' perceptions of conducting child welfare assessments in a Guided Case-Based Learning (GCBL) environment. The goal was to shed light on elements that they pay attention to and what they perceive as helpful or hindering for learning.

As a final section, chapter 8 discusses how both studies uniquely contribute to the discipline. Chapter 9 presents practical, theoretical, and methodological implications for social work and chapter 10 presents conclusions.

2.   Child Welfare Assessment

The purpose of this section is to provide an overview of the definitions of assessment and the regulation of child protection in Germany. Also, the complexity of child welfare assessment and its connection to the human reasoning paradigm is explored. Using theoretical frameworks to facilitate a systematic assessment approach is analysed, and what students should learn about assessment is considered.

2.1.   *What is assessment?*

As part of their job, social workers are constantly conducting assessments. Interestingly there is no singular definition of assessment in the social work literature (Crisp et al., 2004; Milner et al., 2020; Parker, 2020). Whittington (2007) presents four definition categories found in social work textbooks: 1) *process-focused*, 2) *contingent*, 3) *contestation-focused* and 4) *critical social constructionist* definitions. Process-focused explanations perceive assessments as a task that can be learned and professionally applied with a set of methods that provide guidance on what needs to be done, what questions need to be asked and what procedures need to be followed. *Contingent* definitions are similar to process-focused definitions but differ when it comes to the nature and direction of assessment. They for example underline that the nature and direction of an assessment is determined by its goals (ibid.). *Contestation-focused* approaches situate assessment in an area of conflicting interests (such as between the analysis of needs of family members vs. risks for the wellbeing of the child). Finally, *critical social constructionist* definitions emphasize that assessments involve the construction of meanings by those involved, so they cannot be determined by objective facts. According to this logic, a social worker's assessment report represents their own perception and narrative but not necessarily that of the client (ibid.). Regardless of the multiple definitions, there is consensus that assessment is connected to the process that helps practitioners get to know their clients better in order to make decisions (Killick & Taylor, 2020; Milner et al., 2020; Parker, 2020). Assessments are

"intentionally rational" (Whittington, 2007). They are an essential component of social work, including the continuous planning, intervention, and evaluation of the services provided to clients (Parker, 2020).

2.2. *Setting the context: child protection in Germany*

Assessments are also inherent in child protection work. In Germany, article 6 of the constitution of the federal republic, guarantees the protection of children's rights to care and education as well as the rights of the families. Federal family law regulates mandatory state intervention by family courts if best interests of a child are threatened, and there is a federal social code (book VIII of the social code: *Kinder und Jugendhilfe*) regulating duties and rights of the children and youth welfare authority (*Jugendamt)* (Kindler, 2008). Organized on a district level most of the time, the welfare authority has an "obligation to offer a range of services for families in need and to investigate in cases of suspected child abuse" (ibid., p. 318). The German Civil Code (§1666) defines child endangerment as any threat to a child's physical, mental, or psychological well-being that would likely impair development if left unattended. The overall aim of the child and youth service is to support parents in creating suitable environments in which children's individuality, well-being, and social development can be enhanced. In this way, child protection in Germany is said to be family-oriented and holistic (Gilbert et al., 2011; Witte et al., 2020). The involvement of both children and family in assessment and decision-making is strongly recommended, though not possible at times. With social workers working in various sectors such as schools, hospitals etc., encounters with children are always expected. They are mandated to report in cases of perceived child abuse and to provide help as a way of preventing harm from happening. Consequently, child protection is a cross-cutting issue that deserves special attention in education.

When assessing child welfare cases, social workers must make difficult real-life decisions based on limited knowledge, uncertainty, and time pressure (Bastian & Schrödter, 2014; Helm,

2011; Whittaker, 2018). Mistakes in decision making, for example regarding when to or not to intervene in cases of suspected child abuse, can be costly for involved clients. Kindler (2008) underlines that stakes are high in child protection. Children may be left without protection, face unnecessary separations from parents, and experience violations of their rights when assessments and interventions fail to meet standards (Kindler, 2008; Munro, 1996). Providing effective support to both families and children is a particular challenge in the practice of child welfare (Bundy-Fazioli et al., 2009).

In spite of the complexity and uncertainty associated with child welfare assessments, the ultimate goal is to reach the best decision based on a deeper understanding of the case and deeper engagement with the available knowledge (Munro, 1996). While some errors in decision-making cannot be avoided, adopting a critical approach can be helpful (ibid.). In child welfare assessments, attention needs to be paid to the narratives of the children and families involved (Holland, 2010), and available information should not be taken at "face value" (Parker, 2020). Having the ability to organize, systematize, and rationalise gathered knowledge is an essential skill that helps produce focused and factual assessments (ibid.).

2.3. *Child welfare assessments and human reasoning*

With no doubt in social work assessments need to be accurate to avoid grave implications for clients. The field of child protection has therefore examined ways of understanding and reducing human fallibility in assessment. In English-speaking social work, most research is based on works such as Munro (1999) report, which supports the notion that some errors are a result of limitations in human reasoning.

In this area, distinctions have typically been made between two types of cognition: intuition and analysis (Epstein, 1994; Sloman, 1996). According to Kahneman (2003), system 1 reasoning (equated to intuition in judgement and decision making) is characterised by being fast, automatic, effortless, and emotionally charged, while system 2 reasoning (equated to

analysis in decision-making and judgement) is slow, controlled, and comes with effort (also see Stanovich & West, 2000). Analytical reasoning involves a "step by step, conscious, logically defensible process" (Hammond, 1996, p. 60) yet answers produced by intuitive reasoning are without use of the aforementioned.

Munro (1999) observed that debates in the caring professions, have primarily focused on determining the most suitable form of reasoning in their respective disciplines. Clearly there is considerable tension between scientific and humanistic epistemologies and traditions (ibid.). Using Hammond's (1996) model of reasoning, Munro (1999) explains that proponents of analytical reasoning in social work emphasize the benefits of following a step-by-step, logical, and transparent (scientific) approach in assessment. The opponents contend that intuitive reasoning, which relies on elements such as empathy and intuition, is more appropriate, particularly in situations where rapid decision making is required (ibid.). These two forms of reasoning are easily identifiable in child protection work (Munro, 1999). Practitioners seem to heavily rely on intuition, which comes at a significant cost (ibid.). Munro (1999)'s report inspired reflection on the role of science and scientific methods in social work. Consequently, efforts to improve analytical-based practise resulted in the development of risk assessment tools, checklists, and guidelines (Gillingham, 2006; White et al., 2006). However, this emphasis on analytical reasoning in child protection work has also diminished the value of professional intuition and consequently impacted the effectiveness of professional practise (Helm, 2011).

Increasingly, Hammond (1996)'s cognitive continuum theory has been adopted by child welfare professionals to understand judgement as an interplay between intuition and analysis. By building on the notion of quasi-rationality as the dominant cognitive form, Helm (2022) provides a description of how decisions about child welfare are typically made through interaction with others, for example colleagues or clients. This way, decision making is not

solely based on intuition or analysis but rather on a combination of both. It is Helm's (2022) contention that social workers' encounters and interactions contribute to the use of different modes of cognition during decision-making.

According to Munro (1999), improving decision-making in child welfare is crucial but starts from acknowledging that human judgement is flawed. Moreover, human judgment is characterized by a reluctance to change preconceived notions. It is therefore necessary to view professional judgments as valuable, but fallible, as hypotheses requiring further investigation (ibid.) Students' ability to generate hypothetical ideas can be enhanced using theoretical frameworks for assessment. Below, the context for their use is elaborated.

2.4. *Theoretical frameworks for assessment*

One such famous theoretical framework for teaching assessments in social work— the holistic competence model has been proposed by Bogo (2018). In general, social work is concerned with theories that explain how societal structures limit the social functioning, participation, and potential of individuals (ibid.). The relationship between theories and assessment can be explained in two ways (Whittington, 2007). First, the former seeks, to explain the nature, process, or social function of the latter. By providing a theoretical basis for the points being addressed, such explanations assist in grounding the assessment process (ibid.). Furthermore, theories guide the type of information, how to collect it, and how to use it in gaining a deeper understanding of the client's situation (Whittington, 2007).

Social work practices around the world employ a variety of theoretical frameworks for assessment. These may share many features regardless of country (Parker, 2020). Systems approaches are amongst the common types of assessment frameworks (Milner et al., 2020). As the term implies, systemic refers to the quality of belonging to a group/entity that is greater than its parts (ibid.). While natural systems are capable of self-sustenance, social systems can develop their own survival energy through family relationships, for example. In the systems

understanding, all parts (systems) interact, and are at times, in tension with each other. System approaches in assessment follow the aim of understanding how individuals are affected by "systems" such as schools, families, or even cultural norms. In this way, practitioners can identify potential stressors in a client's life and identify resources that can be used to bring about positive change.

In German-speaking countries, the "Swiss School of Social Work" presents the "systemic paradigm of social work", a prominent system theory framework. It consists of a five-level knowledge structure that encompasses overarching theories as well interventional models. Integrated therein is the "general normative action theory" which suggests that professional problem-solving follows a specific rationale and structure (Obrecht, 2007). It is theory-informed and addresses social problems through an ethical lens (ibid.). This framework outlines a series of steps with accompanying questions to assist with solving problems. As part of this process, the following steps are undertaken: describing the situation, reconstructing the case, assessing risks, defining the problem, setting goals, making decisions, and evaluating outcomes. It is important to note that these steps are not rigid and should be approached iteratively (Staub-Bernasconi, 2018).

Hypotheses can be used to explain the situation, evidence can be evaluated to suggest interventions, and conclusions can be drawn about possible outcomes using the "general normative action theory". This is in line with Parker (2020), who underlines that information cannot be taken at 'face value' during assessment. Such practise models can help social workers organize, systematize, and rationalize gathered knowledge in an objective manner. By placing scientific knowledge at the core of social work practice, a culture of knowledge can be fostered (ibid.). Sommerfeld (2014), one of the theorists of the "Swiss School", argues that social work can be described as a "transdisciplinary action science" based on these grounds.

Clearly, the steps outlined like the "general normative action theory" align with "typologies of epistemic activities" crucial to the scientific process. Scientific reasoning and argumentation involves various activities such as problem identification, questioning, hypothesis generation, artefacts construction, evidence generation, evidence evaluation, drawing conclusions, and communicating and scrutinizing scientific reasoning and its results" (Fischer et al., 2014, p. 39). Furthermore, there are various motivations for engaging in scientific reasoning and argumentation. Fischer et al. (2014) refer to these as epistemic modes, with scientific-based reasoning and argumentation in practice being part of them. Sodian and Bullock (2008) underline the intentional and strategic nature of scientific reasoning which aligns with conducting assessments in child welfare. When teaching about assessment, social workers may find it helpful to recognize the parallels between scientific reasoning and argumentation. Instruction can be used to encourage students to engage in the production and use of scientific knowledge (ibid.).

2.5. What should social work students learn about assessment?

The ability to conduct assessments is a core competence in the social work field (based on standards of associations of social work education such as the Fachbereichstag Soziale Arbeit in Germany). It is, however, debated whether it is appropriate for learners to be taught how to use assessment frameworks or rather "principles" of assessment (Whittington, 2007). One concern about the use of predefined frameworks is that they may induce a "trained incapacity", whereby social work skills are restricted or cannot be easily transferred to new setting or clients (ibid.). Those advocating for teaching principles of assessment argue that learners need to be equipped with skills like critical thinking as these are not limited to specific target groups (ibid.). VanLehn (1996) maintains that critical thinking involves a wide range of knowledge components, including heuristics and procedures.

In developing a model for professional knowledge that can be transferred to various other disciplines and using classifications of knowledge in the fields of education and medicine, among others, Förtsch et al. (2018) construct a two-dimensional, interdisciplinary framework. Therein, differentiation is made between cognitive and content types of knowledge. Cognitive knowledge is categorized into types such as, "declarative, conceptual, strategic, and conditional knowledge" (also see Kopp et al., 2008). Yet, their interpretations differ across disciplines prompting Förtsch et al. (2018) to opt for more encompassing definitions. This thesis follows this suggestion. By using the term "*knowing that*" the authors refer to facts, concepts and principles, *"knowing how"* stands for action, procedure, and manipulation knowledge and "*knowing when and why*" is used in reference to being aware of when and why to apply the first two.

In the case of child welfare assessment, the first category "*knowing that,*" can include knowledge about child protection laws and theoretical knowledge on child development, "*knowing how"* may include knowledge on procedures such as informing the police and organising home visits *and "knowing when and why"* may include being able to make connections between the first and second components. For example, informing the police may be based on the awareness that it would be important to have security guaranteed during a home visit. In addition, this may be useful in initiating legal proceedings. In the event of suspected child abuse, knowledge of child protection laws may be necessary.

In the second dimension, three different types of content-related knowledge are classified: *content*, *pedagogical content,* and *pedagogical-psychological* knowledge. *Content knowledge* comprises of all domain-specific knowledge crucial to the field as well as domain specific knowledge related to referential disciplines. In the case of child welfare assessment, this can be knowledge from the field of psychology explaining child development. *Pedagogical content knowledge* can be understood as content-specific knowledge relevant to sharing information

with others. In child welfare assessment, this could entail the ability to work collaboratively with clients to come up with possible solutions. Finally, *pedagogical-psychological knowledge includes domain general knowledge* crucial to the area of focus. In the case of child welfare assessment, this could represent knowledge about communication models, for example, motivational interviewing. Observably, the second dimension of Förtsch et al. (2018)'s model suggests knowledge worth fostering in professional interactions. With the focus of this thesis being on supporting the knowledge acquisition of individual students, the second dimension of this interdisciplinary framework was not explored further. Considering the argument that social work assessments are effective when they are able to achieve congruence between 'what, 'how' and 'why' (Statham & Kearney, 2007), practise opportunities need to be provided for students. The following section examines educational and instructional approaches that can facilitate this process.

3.   Fostering Knowledge Acquisition for Assessment

In this section, the foundation of Case-based reasoning (CBR) is presented alongside studies that build on its principles. Case-based learning (CBL) as a constructivist educational approach is analysed before the role of scaffolding in CBL is explained. Last, adaptable CSS and metacognitive reflection prompts as possible scaffolds for teaching child welfare assessments are explored.

3.1.   Case-based reasoning (CBR)

CBR is a "form of analogical reasoning" that explains problem-solving based on previous experiences" (Kolodner, 2014). Initially developed to enhance machine learning and intelligence, CBR draws inspiration from individual's everyday reasoning (Kolodner et al., 2003). Schank (1999) highlights the concept of "dynamic memory" – where mental structures are shaped by experiences and an expectation that such structures can be altered. Crucial to this process is the ability to identify similarities between current and past experiences, filter out irrelevant aspects of the present situation, and to focus on the essential elements in both scenarios (past and present). Schank's dynamic memory theory provides a solid foundation for understanding knowledge acquisition processes.

This theory encompasses various knowledge structures, such as *scripts*, which are schemas explaining the organization of episodic memory (Ramirez, 1997). According to Schank and Abelson (1977) *scripts* consist of sequences of stereotypical actions. They are collections of specific situations organized around common elements of similar episodes. Over time, scripts are formed through repeated encounters with those situations (Ramirez, 1997). *Scenes*, on the other hand, are knowledge structures that capture generalities from scripts and abstracting them. *Memory Organization Packets* (MOPS) on the other hand, organize sequences of scenes occurring during specific events to achieve particular goals. Typically, MOPS include a central scene that represents the essence or purpose of the events. *Thematic Organization Points* (TOPS)

capture similarities between situations (ibid.). Key factors for learning in CBR include the ability to access and interpret experiences, derive lessons from these, establish connections, and transfer these lessons to new contexts (Kolodner, 2014). Additionally, analyzing the usefulness of lessons and anticipating their application in other settings is crucial. The CBR paradigm emphasizes the importance of failure and feedback, as they offer opportunities for reflection and redefining challenges, respectively, enabling learners to approach challenges in a different manner (ibid.).

Principles of CBR have been explored in different studies like in the area of risk assessment in public transportation. For example, Fan et al. (2015) investigated the use of CBR to generate project risk response strategies in a fictional city in China (referred to as City S). They outlined five stages of the process: (1) representation of target and past cases, (2) retrieval of past cases and comparison of risks, (3) retrieval of similar historical cases and assessment of similarities to the target case, (4) revision of inapplicable risk responses based on analysis of response relations, and (5) generation of potential risk responses by evaluating a set of possible strategies. It has also been found that CBR can facilitate emergency responses in situations such as gas explosions (Fan et al., 2014), predict medical outcomes (Ting et al., 2010) and predict business success (Lin et al., 2009).

3.2.   *Case-based Learning*

Case-based learning (CBL) is an instructional approach that builds on CBR. Kolodner (2014) integrated principles from Roger Schank's research on intelligent tutors into the development of learning environments. This integration revealed that referencing past experiences during problem-solving was an effective approach for understanding reasoning processes in ill-structured discipline (ibid.).

As such, CBL utilizes a constructivist educational perspective, combining cognitive theories with classroom practices to elicit students' involvement in activities like collecting data, generating hypotheses, evaluating relevant information to solve problems, or conducting

realistic analyses (Kolodner et al., 1996). However, Kirschner et al. (2006) caution that such approaches ignore the role of the human cognitive architecture more so the limited capacity and duration of the working memory when dealing with new information. Nonetheless, and in resonance with other learning scientists like Bransford et al. (2000), Kolodner et al. (2003) argue that learning is strongest when situated in authentic experiences. As such, these provide "richer and therefore more memorable and accessible representation" (Kolodner et al., 2005). The learner's ability to interpret new experience and incorporate these into memory, to reinterpret and re-index old experiences is crucial to the learning process (Kolodner, 2003). Moreover, the ability to abstract generalizations over a series of experiences helps to expand knowledge (ibid.). As a learning and teaching approach that uses authentic cases to prepare students for practice, CBL provides the opportunity of connecting theory to practice (Thistlethwaite et al., 2012). The use of cases in the classroom is clearly an effective method of bridging the gap between the academic and the real world (Escartín et al., 2015). CBL has often been aided with computer technology (Egonsdotter & Bengtsson, 2022; Kopp et al., 2008) because of the benefits that come with it. Amongst these is the possibility of presenting cases in a digitalized format and the opportunity to structure student's reasoning processes.

Evidence from the medical field, where CBL has a long tradition, underlines the effectiveness of this teaching approach. CBL has been observed to enhance student's learning (Thistlethwaite et al., 2012) and teachers perceive it as motivating and engaging (ibid.). The impacts of CBL are not only be limited to fostering "simple knowledge gain" but also extend to improving outcomes of patient care (McLean, 2016). For example, Kopp et al. (2008), used computer-supported case-based worked examples to examine the effects of errors and feedback on the acquisition of diagnostic knowledge. In this experiment, a fictious student was used to stimulate engagement with a general practitioner who provided feedback in a clinical setting in an online environment. In the condition without errors, students drew the correct conclusions based on the

provided information and finalized the case with the correct diagnosis. In the other condition (with errors), the student made a series of errors. As part of the elaborated feedback condition, a fictitious doctor gave detailed explanations about what was right and wrong as well as possible considerations to the students. Feedback was however limited to what was right or wrong in the alternative condition. One-hundred-and-fifty-three medical students were randomly distributed across the four experimental conditions of a 2*2 factorial design. The researchers found that combining erroneous computer-supported case-based examples with elaborate feedback led to effective learning outcomes.

Like in the medical field, CBL is not novel to social work. Austin and Packard (2009) observed that educators have always used cases to teach micro and macro social work skills and to guide learners through different alternatives and solutions. With CBL, students get the opportunity to apply their knowledge to solve problems in contexts most likely to be encountered in the future (ibid.). In this way, CBL facilitates the development of skills relevant to working with specific client groups and the acquisition of knowledge across different content areas in social work (Crisp et al., 2004)

An exemplary study that applied CBL in social work education was conducted by Oliván-Blázquez et al. (2022). The authors examined the effects of combining a flipped classroom with 1) problem learning activities or 2) case-based learning activities on social work students' academic performance. In the first scenario, students developed problem-based learning activities during flipped classroom teaching. In the second, students developed case-based learning activities. A computer-generated random number sequence was used for group randomisation. Findings revealed differences in categorical and quantitative exam scores with students in the problem-based learning group outperforming their counterparts. Yet, both instructional methods were found to have led to good satisfaction levels with the learning

process. In fact, participants in the case-based learning environments evaluated their learning experience better in a theory -practise transfer item and in an item on critical thinking.

A similar study by Manager and Knowles (2007) examines CBL in social work. These researchers investigated students' perspectives on learning with either multimedia or text-based case studies. Another aim of their study was to examine the feasibility of reusing digitalized learning objects in different contexts. Five short videos clips were recorded with professional actors. They were presented in a windows media format as series showing the perspectives of different actors in a child welfare case. Students from Scotland (*N*=39) worked with these cases in their social work law course while (*N*=57) Canadian students used this material in their social work methods and mental health classes. The students were required to complete a structured survey form in which a five-point Likert scale was used to quantify their perceptions on the different case type presentations (text-based vs. media-based). According to results, students in the multimedia case study conditions felt their learning was enhanced more than their counterparts in the text-based case study setting.

As another example of CBL research in social work, Egonsdotter and Bengtsson (2022) pointed out that despite the long tradition of this teaching approach in social work, advances in technology and information appear to have had less impact on its implementation. In their study, they examined social work students' reflection on learning about child welfare assessments with a computer-based simulation called "SimChild". Participants were third semester social work students from three Swedish universities. A brief overview of "SimChild" and its goals was provided to participants before the exercise. Following, they participated in two phases of individual work, had focus group sessions, and a debriefing session. All students received the same case, but the background information was randomly varied. According to the findings of this study, learning with simulation triggered reflection and an understanding that social problems could be approached from different perspectives.

The studies presented above underline the benefits of using CBL in social work education. With their uniqueness, they reveal that CBL can be used with different multimedia representation and a variety of tools such as flipped classrooms and with simulation. These studies also indicate a paradigm shift on the implementation of technology social work education. A number of concerns were raised in the past, including ethical concerns (Reamer, 2013), limitations in the ability to foster practice skills (Ayala, 2009), and the sterility of online platforms, which encourage passive behaviour. Clearly, in designing CBL with digital means, attention must be paid to the nature of instruction. Regardless of the method used to represent cases in CBL environments, it is generally agreed that learning from cases can be overwhelming. Additional support may be necessary in order to navigate and digest all the information presented. Next, the importance of scaffolding in CBL environments is discussed.

3.2.1. The role of scaffolding in CBL

Based on concerns that CBL can be overwhelming for learners, the need for scaffolding in such settings has been emphasized on different occasions (Hmelo & Guzdial, 1996; Hmelo-Silver, 2006; Hmelo-Silver et al., 2007). During scaffolding, an experienced other (human) or agent helps a learner perform a complex task that is slightly beyond their current competence level. They might, for instance, provide cues, prompts, or even regulate the learning exercise (Reiser & Tabak, 2014). The notion of scaffolding has its roots in Vygotsky's studies of adult child interactions and in the apprenticeship studies. Crucial to this concept is the "Zone of Proximal Development" (ZPD). According to Vygotsky, ZPD represents the distance between actual (determined by the individual's potential to solve problems single-handedly) and potential development (determined by the individual's potential to do so with guidance or in collaboration with a more knowledgeable peer).

According to Reiser and Tabak (2014), scaffolding makes the learning process manageable by simplifying elements of a task into digestible bits and by channelling focus on elements that

need to be considered closely. In scaffolding assessment of child welfare cases for instance, students' can be guided through different steps like case reconstructions or and risk assessments amongst others. Generally, different learning outcomes can be fostered by scaffolding for example:

- the acquisition of domain-specific elements (concepts and procedures),

- reflecting on one's own learning process (metacognition),

- and learning about how the learning environment operates / how to adapt to instructional contexts (Azevedo & Hadwin, 2005).

It is ideal to withdraw or reduce the instructional support over time (fading), especially when the student gains confidence in his or her ability to perform (Hmelo & Guzdial, 1996; Pea, 2004; Wood et al., 1976). Two types of scaffolds are particularly promising in the context of using CBL to teach about child welfare assessments in social work: adaptable CSS and metacognitive prompts. These are closely examined in the next section.

3.2.2. Adaptable computer-supported scripts (CSS)

Computer-supported scripts are scaffolds that provide learners with external guidance about when, how and in what sequence to perform certain activities (Kollar et al., 2006). Due to the considerable amount of information that needs to be considered during assessment, CSS can help students avoid becoming overwhelmed. Evidence suggests that such scaffolds support learning on an individual level and in collaborative settings. Stegmann et al. (2007) for example, examined the effects of collaborative CSS on the facilitation of argumentative knowledge construction. Using a 2*2 factorial design, the authors manipulated 1) the script for the construction of single arguments and the 2) script for the construction of argumentation sequences. One-hundred-twenty students of educational science participated in the study, and they were assigned to groups of three. Subsequently, the three students were randomly assigned

to one of the experimental conditions. The task was to analyse three problem cases in collaborative learning phases and to determine joint solutions in each. According to the results, CSS could improve the formal quality of single arguments as well as argumentation sequences in online discussions. Additionally, CSS improved knowledge acquisition on argumentation, without adversely affecting domain-specific knowledge.

Benefits of using CSS have also been examined in social work education. Spensberger et al. (2022) conducted an experimental study with a 2*2 factorial design. The aim of this research was to examine the effects of different scaffolds (worked examples/no worked examples) and CSS (with/without) on social work students' fallacy recognition skills in a CBL environment. The results indicated that students could improve their skills over time, and that both scaffolds improved skill acquisition, at least when presented individually (and not simultaneously).

It is acknowledged that CSS has great potential, but researchers caution that too detailed guidance could lead to a high "degree of coercion", which could interfere with the natural process of problem solving (Dillenbourg, 2002). If instructional support is too detailed, "overscripting" (ibid.), might limit students' perceived autonomy and self-regulated learning (Mäkitalo et al., 2005; Rummel et al., 2009). Optimal scripting, by contrast, seeks to strike a balance between the level of scripting and the learner's perceived needs (Fischer et al., 2013).

In their paper, "Toward a taxonomy of adaptivity for learning", Plass and Pawar (2020) demonstrate that flexibility of prompts can be achieved with the assistance of computation systems or by providing students with opportunities to interact with the script in a way that allows them to alter it according to their perceived learning needs. In research, the first option is referred to as creating "adaptive systems" (i.e., adaptive scripting). As such, these evaluate students' progress and make suggestions for next learning steps based on observed patterns (Magnisalis et al., 2011; Wang et al., 2017). In a contrasting case, the term "adaptable scripts" is used. Here, students are entrusted with the task of adjusting the script to cater to their own

perceived learning needs (Wang et al., 2017). According to Tabak and Kyza (2018), offering "automatic adaptive guidance" seems easier to implement when working with "well-structured rather than ill-structured tasks". Nonetheless, Vogel et al. (2022) observed that research underlining the positive effects of learning with adaptive scripts as compared to non-adaptive scripts is still rare. With the high cost and time-consuming nature of designing and implementing adaptive scripts being, adaptable CSS appear to be a feasible alternative (Vogel et al., 2022; Wang et al., 2017)

Different studies have investigated the effects of adaptable scripts including Vogel et al. (2022)'s recent work. In this study, which consisted of two experiments, the effects of adaptable scaffolding on learning mathematical argumentation skills were examined. The first experiment compared adaptable Computer-supported collaboration scripts (CSCL) with non-adaptable CSCL. The second study examined the effects of adaptable and non-adaptable heuristic worked examples. A total of 167 students participated in pairs in one of the experimental conditions. In the adaptable conditions, students could freely adjust their learning environment to either minimum or maximum scaffolding at any time, while in the non-adaptable condition, scripts could only be continuously adjusted in one direction (minimal or maximum scaffolding).

In the first experiment, during the minimal CSCL script, learners were guided through three phases of a dialectical discussion (argument, counterargument, and synthesis) and received complementary prompts. In the maximal CSCL condition, students received all the prompts from the minimal scaffolding condition and additional ones that could be automatically inserted. In the second study on heuristic worked examples, students were also guided through the three phases of a dialectical discussion using a process model of mathematical proof as scaffolding. The results showed that non-adaptable maximal scaffolding supported the learning of distinctive skill components. However, learning with the adaptable CSCL script was neither

significantly worse nor significantly better than learning with the maximal or minimal CSCL script. For social-discursive components, maximal heuristic worked examples facilitated learning the best.

In addition, Wang et al. (2017) found that students who worked with adaptable scripts exhibited higher levels of engagement in metacognitive activities such as planning compared to students who worked with non-adaptable scripts. Clearly, studies on adaptable scaffolding highlight the importance of self-regulation skills in order to facilitate effective adaptation. Assessment of progress, continuous monitoring, reflection, and planning of the learning process is required to meet students' needs. (Vogel et al., 2022; Wang et al., 2017). However, such skills are not spontaneously demonstrated in digital learning environments (Azevedo & Cromley, 2004), and students may have difficulties regulating their learning sufficiently (Daumiller & Dresel, 2019). Additional guidance is necessary, particularly for social workers learning about a complex topics like child welfare assessment in guided case-based learning environments. Vogel et al. (2022) suggest that cognitive and metacognitive self-regulation activities can be supported with additional scaffolds. The next section explores metacognitive reflection prompts as a promising option.

3.2.3. *Metacognitive reflection prompts*

Metacognition is often described as analysing one's own thinking process or being aware of one's own thought process. Providing students with opportunities to reflect on and evaluate their learning processes can facilitate its development (Kuhn & Dean Junior, 2004). Metacognitive reflection prompts are instructional measures integrated into a learning context to stimulate and support students' cognitive, metacognitive, motivational, and cooperation skills by asking them to carry out specific metacognitive actions such as planning, monitoring, (Bannert, 2006; Bannert & Reimann, 2012). Prompting students on a metacognitive level has been associated with enhancing self-regulation activities (Engelmann et al., 2021; Guo, 2022).

Even though empirical research suggests that metacognitive reflection prompts have positive effects on important learning processes not much is known about their optimal design. One important question in this regard is how generic and specific prompts should be used. Davis (2003) for example, sought to understand whether scaffolding was required to help students learn how to integrate knowledge (being able to expand, distinguish, and make connections between ideas as well as recognise knowledge gaps). Activities in this study included reading an article, critiquing evidence, critiquing claims, and writing an open letter. N=178 middle school students were assigned to two different prompts for reflection. Generic prompts encouraged students to 'stop and think' without providing any suggestions on what should be thought about. Reflection directions were explicitly provided in the specific prompt condition. An example of such a specific prompt regarding critiquing claims was: "Claims in the article we did not understand well included…". According to findings, students in the generic prompt condition reflected more productively and developed a more coherent understanding of science during their projects.

Evidence supporting the effectiveness of specific prompts has been presented in studies like that of Glogger et al. (2009). In their work, high school students from two classrooms ($N = 51$) were asked to write learning journals as part of a mathematics classroom assignment for two consecutive weeks. Using a within-subjects design, participants received 'non-specific prompts' in one week and 'specific prompts' in the next. The prompts scaffolded different activities such as organization and elaboration. For instance, in the 'specific prompt' setting, students were instructed to summarize the past week's topic using their exercises and math books, and to describe three to five learning outcomes. In contrast, in the 'non-specific prompt' setting, students were asked to organize their learning contents in a clear way, similar to Davis's generic prompts. Specific prompts were found to increase the quantity and diversity of

cognitive learning strategies, as well as the diversity of learning activities as compared to non-specific prompts in this study.

Metacognitive reflection prompts clearly influence how students reflect, but the effects of their specificity on learning are not conclusive. According to Davis (2003), students who were given generic prompts were found to reflect more productively than those who were given specific prompts. In contrast, Glogger et al. (2009) demonstrated that specific prompts enhanced learning processes more than non-specific prompts. As a result of these conflicting findings, the following question arises: what types of metacognitive reflection prompts would be most effective in supporting students acquire knowledge crucial to assessing child welfare cases? The aim of this dissertation was to examine this question in part. In addition to understanding the type of scaffolds that would be more effective, another goal was to analyse how students perceive such learning environments. Mixed methods research is a promising means of examining complex learning processes such as the one described above. An in-depth discussion of this topic will be presented in the following chapter.

4.   Mixed Methods Research

In this thesis, a mixed methods approach was employed to investigate the possibilities and limitations of using scaffolds in teaching about child welfare assessment. The purpose of this section is to present its characteristics and to explore the possible advantages, including the possibility of drawing stronger "meta-inferences" as a result.

4.1.   Characteristics and advantages of mixed methods research

There is consensus that the choice of using a mixed methods approach depends on the questions, purpose, and context of the research (Creswell & Creswell, 2017; Greene, 2007; Tashakkori et al., 1998, 2020). Johnson and Onwuegbuzie (2007) observed that there are various definitions in the mixed methods community before suggesting this general one: "Mixed methods is research in which a researcher or team of researchers combines elements of qualitative and quantitative research approaches (e.g., use of qualitative and quantitative viewpoints, data collection, analysis, inference techniques) for the broad purposes of breadth and depth of understanding and corroboration" (p. 123).

Underlining why combining approaches is relevant, Chi (1997) argued that both quantitative and qualitative approaches have advantages like objectivity and replicability in the case of the former and the ability to provide a richer and deeper understanding of a situation in the case of the latter. However, they do come with limitations. In quantitative research, for example, conclusions can only be drawn based on tested hypotheses, which might limit insights on other factors influencing people's behaviour. Qualitative research is subjective and nonreplicable in nature which limits generalizability (ibid.). Using mixed methods aims at maximizing strengths of both research approaches and minimizing their weaknesses (Connelly, 2009). This is a benefit more so when dealing with complex phenomena such as understanding learning processes (Chi, 1997). In the learning sciences, plurality of perspectives and inclusion of research methods enables a deeper understanding of the "real world learning phenomena"

(Dingyloudi & Strijbos, 2018). In order to understand child welfare assessments, students must be encouraged to engage critically with a variety of sources of information for example. To do so, teachers' focus must not only be on what and how to teach but also on what students say. While learning outcomes can be measured with statistical testing, qualitative inquiry can help explore other crucial factors like students' learning experience. This notion supports potential benefits of mixed methods research in educational research.

Prior to conducting a mixed methods study, it is crucial to know whether qualitative and quantitative approaches would be implemented concurrently or sequentially (Creswell & Clark, 2017). As for the former, data collection and analysis are conducted parallel to each other, and the results are subsequently merged. When it comes to the latter, one research approach is followed by another. When using a concurrent mixed methods design, for example, data from one study can be used to verify data from another, which allows for a more comprehensive understanding of phenomena (Chaumba, 2013). In a sequential mixed methods design, a qualitative study can, for example be conducted first. Findings from this approach can be used to develop a quantitative instrument (ibid.). Consequently, when using mixed methods, it is important to decide how the individual approaches will be weighted in the study as a whole. Knowing how and when the findings would be mixed is important (ibid.). Combining both qualitative and quantitative approaches can happen at different stages for example, during research design, data collection or the data analysis (Bazeley, 2009; Creswell et al., 2003; Onwuegbuzie & Teddlie, 2003).

To ensure scientific validity, both qualitative and quantitative research should adhere to the standards of validation in their respective fields (Venkatesh et al., 2013). For quantitative studies, this means avoiding biases in study design and ensuring the suitability of statistical tests for example (Sheppard, 2019). In qualitative research, attention should be paid to the representativeness of data selection and the validity of generalized statements (Flick, 2022).

Analysis of both qualitative and quantitative data needs to be conducted individually and rigorously making it easy to draw both useful and credible "meta-inferences". These are theoretical statements, narratives or a story inferred from an integration of findings from quantitative and qualitative strands of mixed methods research" (Venkatesh et al., 2013). For instance, in teaching about child welfare assessments, combining both approaches might reveal that offering guidance facilitates students' ability to engage in certain tasks. Positive results from a knowledge test (quantitative analysis) may however not align with students' negative responses (qualitative analysis) regarding the learning environment. A meta-inference in this case could be "students who perform well are still critical of the provided support; can they performance be attributed to the offered guidance or other factors? Having an overarching research question makes it easier to connect both quantitative and qualitative "strands" (Tashakkori & Creswell, 2007). The driving question for integration is "to what extent do the quantitative and qualitative results converge or diverge?" (Buchholtz, 2019, p.144).

In summary, mixed methods research allows for the exploration of both exploratory and confirmatory questions within the same study. This approach provides broader insights compared to using single research methods (Buchholtz, 2019), enabling a deeper understanding of a phenomenon and the discovery of boundaries within existing conceptual frameworks (Venkatesh et al., 2013). Given these benefits, mixed methods research is not a novel concept in social work. The next chapter will explore how this approach has been incorporated in social work educational research. To summarize, mixed methods research allows for both exploratory and confirmatory questions to be explored. Comparatively to using a single research method (Buchholtz, 2019), this approach allows a deeper understanding of a phenomenon and the discovery of boundaries within existing conceptual frameworks (Venkatesh et al., 2013). Due to these benefits, mixed methods research is not a novel concept in the field of social work.

The next chapter will explore how it has been incorporated in educational research in the discipline.

4.2. *Mixed methods research in social work education*

Chaumba (2013) described mixed method research as a "strong toolkit" that allows social workers to engage with and to understand complex issues such as child abuse. Social work research is enhanced by this approach as it incorporates three important elements: the voices of the participants, comprehensive analysis, and a higher level of validity.

In social work education, one study that used a mixed methods approach was that by Abel and Campbell (2009), which compared student-focused versus teacher-centred approaches. Students' perceptions were collected through focus groups and coded. Survey results were analysed using descriptive and inferential statistics (Chi square tests). Mixing of quantitative and qualitative approaches happened during the interpretation phase. Outcomes of both the qualitative and quantitative components enabled the researchers to conclude that students were aware of the differences between teacher-centred and student-centred instruction and preferred the latter.

In a similar line, Carpenter et al. (2006) evaluated a postgraduate program focusing on health and social care professionals in England with a mixed methods design. Experience and the processes of implementation (gathered via participant observation and interviews) were evaluated with a thematic analysis. Outcome measures and changes in perceptions of knowledge and skills were collected with a survey and analysed using descriptive and inferential statistics (ANOVA, ANCOVA, t-tests and Cronbach's alpha). Quantitative and qualitative components were combined at the research design level. According to Carpenter et al. (2006), the quasi-experimental design made it possible to review outcomes comparatively. These authors came to conclusion that well designed interprofessional educational programmes are effective at helping students acquire knowledge and skills for the workplace. Taken

together, findings from these studies shed a light on the benefits of conducting mixed methods research in social work education. Additionally, they suggest that such research can be used to explore a variety of elements crucial to learning. The next chapter presents the conclusions that were drawn from these insights for establishing this thesis' research design.

5.   Consequences for the Research Design

It was the objective of this thesis to understand how CSS and metacognitive prompts could be used to support social work students in acquiring knowledge for assessing child welfare cases. Another aim was to understand how students reflect on conducting child welfare assessments in such learning environments. Two interrelated studies were conducted to gain a comprehensive and detailed overview. A quasi-experiment with a 2*2-factorial between-subjects design was used and open-ended questions were integrated therein to support students' reflection processes. For examining the effects of scaffolds on knowledge acquisition, a quantitative approach was found to be suitable. To understand students' perceptions, qualitative exploration was found to be promising. Using mixed methods was intended to triangulate findings for a more comprehensive picture. A single method of inquiry would have resulted in fragmented knowledge regarding the use of instructional support.

5.1.   Overview of the empirical studies of this thesis

This doctoral thesis includes two studies based on data collected through a quasi-experiment. An online CBL environment was created to guide students through the learning process, and four vignettes were incorporated to stimulate engagement in the assessment of a child abuse case. Prior to the study, a social work professor and two practitioners reviewed these vignettes to ensure authenticity, comprehensibility, and closeness to real life situations. In addition, a simplified version of the German law book regulating child welfare and protection was included in the learning environment. Manipulations in the pertained to the type of CSS (*strict* vs. *adaptable*) and metacognitive reflection prompts (generic vs. specific). Participants were randomly assigned to either one of the guided case-based learning (GCBL) conditions or a control group (unguided case-based learning-UGCBL). In the experimental conditions, all students were guided through the first assessment with a *strict script.* Questions and hints scaffolded all steps of the assessment: describing a situation, defining the problem and context

of risk, clarifying goals of a possible intervention, and decision making. During the second treatment, students in the *adaptable script* condition were able to select the steps for which they wanted to have guiding questions and hints displayed. Their counterparts continued working with a *strict script*. The second independent variable, the *metacognitive reflection prompts* were introduced between the first and second treatments. With *specific metacognitive reflection prompts*, direction of refection was provided with the questions "What was hard for you to do during the last assessment?" and "What was easy for you to do during the last assessment?" In the *generic metacognitive reflection prompt* setting, students were asked to reflect openly. Students in the control condition, received neither CSS nor prompts. Data collection was done in five university campuses of applied sciences in Bavaria (The Catholic University of Applied Sciences Munich Campus and Campus Benediktbeuern, University of Applied Sciences, Munich, University of Applied Sciences Landshut and the and the Nuremberg Tech)

Study 1

The aim of study 1 was to understand how social work students could be supported in their acquisition of knowledge for assessing child welfare cases. The following research questions were raised:

- RQ1: Does offering students additional guidance during case-based learning foster their acquisition of different kinds of knowledge crucial to assessment?

- RQ2: What are the effects of different types of CSS (adaptable vs. strict) and metacognitive reflection prompts (specific vs. generic) as well as their different combinations on the acquisition of the knowledge facets crucial to assessment?

- RQ3: What is the relation between the extent to which students (in the adaptable CSS condition) use the opportunities to adapt the CSS and the acquisition of the knowledge facets crucial to assessment?

A multivariate ANCOVA using the three facets of knowledge (conceptual knowledge, strategic knowledge, and reasoning) as dependent variables was performed to compare the students who received support to those who did not. Additionally, univariate two-way ANCOVAs with the single skill facets of conceptual knowledge, strategic knowledge, and reasoning as dependent variables were conducted to examine the effects of the scaffolds on knowledge acquisition. The frequency by which students actively adapted the CSS influenced the knowledge acquisition was also analysed.

Study 2

Study 2 took a closer look at the students' learning processes. The aim was to understand students' perceptions of working in a scaffolded CBL environment. The following research questions were raised:

- How do students describe their experience of conducting child welfare assessments in the GDBL environment?

- What elements do they pay attention to, and which factors do they perceive as helpful or hindering?

Students' written responses were analysed using a qualitative content analysis (Kuckartz, 2019). According to Schreier (2012), qualitative content analysis is systematic and flexible (enabling the adjustment of coding framework to the material being examined) and reduces qualitative material (ibid.). For the thematic analysis, Kuckartz' approach was chosen over that of Mayring (2014) and Schreier (2012) because it underlines the use of both data and theory

driven analysis at the beginning of the coding process. Additionally, this approach was supported by computer software (MaxQDA) which made it easier to engage with large amounts of data. Kuckartz (2019) observes that no matter which variant is used, the primary goal of qualitative content analysis remains the work with categories (codes) and the construction of a coding framework based on clear research questions (ibid.). In line with this, the research questions in the second study were limited to students' experience and the elements that they paid attention to in GCBL environment. Other themes that emerged during coding such as student's problemsolving strategies, are not reported about in the context of this doctoral thesis. The next section presents these two empirical studies in detail.

6. **Empirical Study I**

Teaching Students to perform Child Welfare Assessments with Adaptable Computer-Supported Scripts and Metacognitive Reflection Prompts

Teaching Students to perform Child Welfare Assessments with Adaptable Computer-Supported Scripts and Metacognitive Reflection Prompts

Assessing cases of child welfare, requires the ability to engage with different sources of information systematically. This study examined how Case Based Learning (CBL) can be used to support social work students (N=104) acquire knowledge crucial to assessing cases of child welfare and whether benefits of CBL could be maximized by structuring the learning process. We conducted a 2*2 quasi experiment and randomly assigned the students to one of the conditions: computer support scripts (adaptable vs. strict scripts), metacognitive reflection prompts (generic vs. specific) or a control group. Students in the Guided CBL environment acquired better conceptual knowledge scores compared to counterparts in the unguided CBL environment but not strategic knowledge and reasoning. In the post test, generic prompts and adaptable scripts were found to be single handedly effective in fostering conceptual knowledge but not when combined. Future research can examine possibilities of scaffolding activities of assessment to achieve congruent use of conceptual, strategic knowledge and reasoning.

Keywords: assessment, computer supported scripts, adaptability, case-based learning, metacognitive reflection prompts, child welfare

Problem statement

In assessing cases of child welfare, social workers need to take individualized and thoughtful approaches paying attention to the needs of the children, the information they collect, how they interpret it and to make fair and transparent decisions based on professional judgment and understanding (Horwath & Platt, 2019). Decisions made (like to intervene or not in case of suspected child abuse) can have an impact on the lives of social work clients (Munro, 2008; Taylor, 2013). Thus, teaching social work students to engage in high-quality assessment processes that include dealing with different sources of information systematically and critically is crucial, giving rise to the question of how students can be supported best. With research showing that social work practice skills can be developed successfully online (Cummings, Chaffin, & Milam, 2019; Wretman & Macy, 2016), digital case-based learning environments are promising in this respect.

Further research shows that such environments are even more effective when they provide guidance that helps students engage in a structured learning process (Kopp, et al., 2009). One example would be to enhance the learning environment with a script that prompts learners to engage with different activities of an assessment in a sequenced way (Kollar, et al., 2006). On the downside, though, such scripts come with the potential danger of limiting active engagement and autonomy (Dillenbourg, 2002). Thus, designing scripts in a flexible way that would help students acquire knowledge and skills that are crucial for child welfare assessment without restricting autonomy is an important challenge for the designers of online environments for social work students. Such environments can further be enhanced with metacognitive prompts that help students reflect upon their learning (e.g., Bannert, 2006). Thus, this article presents an empirical study that investigates the effects of different variants of an online case-based learning environment on social work students' acquisition of knowledge for the assessment of child welfare cases.

Child welfare assessment in social work

Conducting assessment in the field of child welfare is complex (Holland, 2010) and follows the aim of safeguarding children from harm, preventing harm from reoccurring or even beginning (Horwath & Platt, 2019). The right course of action depends on the context and severity of the case. Social workers need to engage deeply with their clients by" investing time and care [in making] helpful explanations of what is happening and how things could be improved being more rigorous and systematic" (Milner, et al., 2020, p. 59). The ability to collect, systematize and rationalize information while paying attention to the uniqueness of each case are important abilities (Parker, 2020).

Regardless of the multiple definitions in social work literature, there is consensus that assessment is connected to the process that helps practitioners undertake decisions (Killick & Taylor, 2020). Assessment is "intentionally rational" (Whittington, 2007) and it helps practitioners understand their clients better. Take this fictional case example into consideration:

A family midwife who began working with the family while the mother was pregnant called child protection authorities following a routine visit. She voiced concern about the safety of the baby Lillian (10 months), having observed bruises most especially around the legs. In an attempt to find out what had happened, Lilian's parents reacted defensively and violently asked the midwife to leave. Additionally, the midwife says she had the impression both parents were drunk.

Approaching this case, the social worker can record the credentials of the reporting midwife and collect more information from them about the family (who the parents are, who else is involved, where and how they live), check if there is any record about the family in question (contact with the authorities in the past, incidences of abuse) and based on this make a judgment about the need of immediate action to protect the child. Drawing on this, the family and different agencies might need to be informed (e.g., the police, family court), and a house visit

might be necessary. Attention must be paid to understanding the family's history in a meeting with colleagues or different professionals. Using theoretical underpinnings (Milner, et al., 2020), for example about symptoms and signs of abuse in minors, would be necessary to analyse and understand needs and resources of the family. Following an analysis of all this information, the social worker would make a decision about how to proceed with the case. The presented possibilities of the social worker's actions give an overview of the complexity of assessing child welfare cases (see Haug & Höynck, 2016, for example, on reporting abuse in Germany).

Associations of social work education like the CSWE or the Fachbereichstag Soziale Arbeit (in the case of German schools of social Work) consider assessment to be a core competence. Students are expected to demonstrate skills of assessment in theory and during placements (Martin, 2010). Social work educators are encouraged to engage with innovative ways of helping students gain confidence in their knowledge and practice (Fengler & Taylor, 2019). One way of achieving so is by fostering a knowledge culture that situates scientific knowledge at the centre of social work practice (Sommerfeld, 2014).

One framework that is used in German speaking countries was proposed by the "Swiss School of Social Work" combining different theoretical frameworks into an umbrella referred to as the "systemic paradigm of social work" (Obrecht, 2005; Staub-Bernasconi, 2018). Also integrated therein is Obrecht's (2007) "general normative action theory" which can be used to structure the problem-solving process. According to Obrecht, professional problem solving follows a certain rationale and structure, is theory-informed and addresses social problems through an ethical lens. Based on the general normative action theory (2007), this involves the steps of (1) describing the situation (Who is involved? What has happened?), (2) reconstructing the case history (What happened in the past and how has it contributed to the current situation?), (3) examining the context of risk (Is there a need for immediate action? What is likely to happen

without action?), (4) defining the problem (What are social norms and how is the current situation a deviation therefrom? What would be ethical?), (5) examining goals of possible intervention (How and what needs to be done and with which resources?), (6) making a decision (What might be a suitable intervention and what it might achieve?) and (7) evaluation. In line with the logic of conducting assessments, these steps are of no rigid structure (Staub-Bernasconi, 2018) and their use ought to be "iterative". Fengler and Taylor (2019) observe that guiding questions can be helpful in promoting social workers to pay attention to the assessment process.

Social work assessments are said to be effective when they can achieve a congruence between *what to do, how* to do it and *why* (Statham & Kearney, 2007). Even though this differentiation does not use scientific terms, it is well compatible with typologies of "knowledge" in other fields. In creating a multidimensional interdisciplinary framework for systematizing professional knowledge, Förtsch and colleagues (2018), for example, highlight three types of knowledge: (1) Conceptual knowledge *("know what"*) that includes concepts, facts and principles. (2) Strategic knowledge ("*know how"*) that includes actions, procedure and manipulations needed to learn a certain competence. And (3) reasoning ("*know when and why"*), which stands for the ability to connect the aforementioned components, i.e., knowing when and why to apply the strategies and conceptual knowledge.

In the example presented earlier about baby Lillian, a practitioner might see the need for immediate action and decide based on rules and regulations of the child welfare and protection laws (conceptual knowledge) to inform relevant authorities like the police (strategic knowledge). The connection between these two knowledge types (i.e., the reasoning) could be that authorities need to provide security in case of a planned home visit or to initiate legal procedures necessary to ensure the safety of the baby.

Case-Based Learning (CBL) as an instructional approach to facilitate acquisition of knowledge for assessment.

Teaching in social work aims at fostering students' reflexivity, reducing the use of inert knowledge by providing students with room for deeper engagement with all three knowledge components (conceptual, strategic knowledge, and reasoning). In teaching about child welfare assessment, educators can for example create cases with varying severity of abuse or neglect as a means of introducing students to different scenarios likely to be encountered.

Using cases is not novel to social work education. Austin and Packard (2009) observe that cases have long been used to teach micro and macro skills and that the traditional approach was having educators discuss case scenarios while guiding learners through different alternatives and solutions. Solving authentic cases has been described to facilitate the acquisition of skills relevant for working with particular groups of clients in social work and the development of knowledge in various content areas (Crisp, et al., 2003).

The value of using cases for the acquisition of applicable knowledge is underscored in Kolodner's case-based reasoning (CBR) cognitive model. CBR is a "form of analogical reasoning" which explains problem-solving based on past experiences (solutions) that worked (Kolodner, 2004). Kolodner (2004) found that making inferences during problem-solving was a suitable approach for ill-structured disciplines and when dealing with complex problems, as is the case in the field of child welfare and protection.

An instructional approach that builds on Kolodner's CBR approach is called case-based learning (CBL). It aids learners to reflect, interpret and to apply their own or others' experience in problem solving (Kolodner, et al., 2013) and "typically takes place in small face-to-face groups" (Thistlethwaite, et al., 2012, p. 434). In the past, CBL has often been implemented by aid of computer-based technology. On the one hand, computer technology offers the opportunity to present cases in a digitalized format, and on the other to structure students' reasoning process with the help of scaffolds like simulations and computer-supported scripts

(CSS). In social work, for example, a study examining the use of SimChild, a computer-based simulation to stimulate engagement in assessing cases of child protection, found that the approach triggered reflection and an understanding that social problems could be approached with different perspectives (Egonsdotter & Bengtsson, 2022).

Yet, CBL can be challenging for learners, as it requires them to tackle cases in a strongly self-directed way. It is thus not surprising that research has investigated how CBL can be enhanced with scaffolds that support students' engagement in high-quality learning processes. For example, in a medical context, Kopp et al. (2009) found that combining complex erroneous case-based examples with feedback helped students improve their diagnostic knowledge in a computer-based CBL environment. Evidence from studies such as this seems to suggest that the effectiveness of CBL can be improved by adding further instructional support that would guide students through the analysis of cases.

Enhancing CBL with Adaptable Computer-Supported Scripts

One way to provide guidance in computer-based CBL environments is the integration of computer-supported scripts (CSS; see Spensberger, et al., 2022). CSS are scaffolds which provide learners with external guidance about when, how, and in what sequence to perform certain activities (Kollar, et al., 2006). In the case presented earlier on, a CSS might help a student gain overview about Baby Lilian's family by channeling their focus on describing the situation, first engaging with who the involved actors are, how they are related to each other, and what is reported. A CSS could be made of different sets of prompts guiding the student to conduct further steps of a child welfare assessment (like a case reconstruction, risk assessment etc.) in a systematic way.

CSSs have been found to be effective in supporting learners to acquire domain specific knowledge and cross-domain skills (Vogel, et al., 2017). In social work, Spensberger et al. (2022) conducted an experimental study with a 2*2 factorial design with different scaffolds

(worked examples/no worked examples) and CSS (with/without) to foster social work students' fallacy recognition skills in a CBL environment. The results showed that students could improve their skills over time, and that both scaffolds improved skill acquisition, at least when they were presented individually (and not simultaneously).

While acknowledging their potential, researchers caution that CSS offering too detailed guidance may interrupt the natural process of problem solving and that way cause "over-scripting" (Dillenbourg, 2002). This might limit students' perceived autonomy and self-regulated learning (Hesse, 2007; Mäkitalo, et al., 2005; Rummel, et al., 2009). Optimal scripting thus seeks to strike a balance between the level of scripting and learners' actual and/or perceived needs (Fischer et al., 2013).

In line with this reasoning, research has sought ways to increase the flexibility of CSSs (Dillenbourg & Tchounikine, 2007). One such way has been through *adaptive* scripting. This is the case when the CSS is "automatically adjusted" to the level of the learners' skills (Kollar, et al., 2018), for example based on a Machine Learning algorithm that can diagnose the quality of students' reasoning processes. Yet, the development of such algorithms is costly, both from a time and a money perspective. An alternative, less costly way of achieving flexibility might be through the provision of *adaptable* CSS (Wang, et al., 2017). Here, the idea is that the CSS is modified by the learners themselves, rather than by some external force. In that way, based on their self-perceived needs, they can decide on what components of a CSS (e.g., different kinds of activity prompts) they want to have displayed in order to be supported, and which ones not (Plass & Pawar, 2020). By putting the learner into an active role of controlling and defining the learning process, *adaptable* CSS provide individualized support for the learner.

Wang and colleagues (2017) provide evidence that *adaptable* CSS can be an effective way of achieving flexibility and that these types of CSS can improve students' self-regulation skills in a computer-supported collaborative learning environment. In their experimental study, 87

university students, the majority of them students of educational science, were randomly assigned to triads with the task of solving problem cases based on educational theories. The authors varied whether triads were supported with a *non-adaptable* CSS, an *adaptable* CSS or no CSS at all. Results of this study showed that learning with the *adaptable* CSS increased students' engagement in planning processes as compared to learning with the *non-adaptable* CSS. Additionally, learning with the *adaptable* CSS enhanced engagement in monitoring and activities of reflection as compared to learning without a CSS.

Reflection prompts to support students' adaptation of CSS

In digital learning environments, students do not spontaneously demonstrate self-regulating skills (Azevedo, et al. 2004; Azevedo, 2018) or encounter hardship regulating their learning sufficiently sometimes (Daumiller & Dresel, 2019). Learners with low self-regulation skills might struggle to make the right decisions that would actually be beneficial for learning. In the case of CSS, not all learners might have the skills to ensure a smooth adaptation of the CSS to their needs (Wang, et al., 2017). Providing additional support concerning their adaptation decisions might often be warranted. One form that such support might take is metacognitive prompting.

Metacognitive prompts are instructional measures integrated in a learning context to stimulate and support students' cognitive, metacognitive, motivational, and cooperation skills by asking them to carry out specific metacognitive actions such as planning, monitoring, or reflecting upon their learning process (Bannert, 2006; Bannert & Reimann, 2012). Based on available research, metacognitive prompts can significantly enhance self-regulated activities (Engelmann & Bannert, 2021; Guo, 2022) and learning outcomes (Zheng, 2016). Yet, there is also concern that metacognitive prompts might automate the reproduction of "step by step responses", but not always result in an "integrated understanding" about for example how ideas are connected to one another (Davis, 2000).

For metacognitive prompting to be effective in online learning, enough time needs to be provided for the students to learn and automatize the activity, and the relevance of the prompts needs to be explained precisely (Bannert, 2006). In fact, in addition to adaptability and the need to provide feedback, writing prompts in a specific manner was found to be one of the variables moderating the effectiveness of metacognitive prompts (Guo, 2022).

Evidence for the usefulness of metacognitive prompts comes from a study by Davis (2003) that sought to examine if scaffolding was needed to help students reflect in a manner leading to knowledge integration (being able to expand, distinguish, and make connections between ideas as well as recognizing weaknesses in their knowledge), referring to this as "productive reflection". In this empirical study, 178 middle school students (assigned to two different reflection prompt settings) worked in pairs on four main tasks in a science class: reading an article, critiquing evidence, critiquing claims, and writing an open letter. In the generic prompt condition, students were encouraged to "stop and think" without providing hints about what to focus on. In the specific prompt condition, the direction for reflection was explicitly provided. An example of such a prompt regarding critiquing claims was: "Claims in the article we did not understand well included…". Results showed that students in the generic prompt condition reflected more productively and developed a more coherent understanding of science during working on their projects compared to students in the specific prompts setting.

Other research, however, provided evidence for the positive effects of specific when compared to generic prompts. For example, Glogger and others (2009) prompted students to write journals in a mathematics classroom. Regarding organization, students in the "specific prompt" setting were asked to compose a brief summary of the past week's topic using their exercise and math-books. Additionally, they were asked to describe three to five learning outcomes. In contrast, students in the "non-specific prompt" setting were simply asked to organize their learning contents in a clear way. Besides organization, students in both settings

("specific" and "non-specific") received prompts on metacognition and elaboration. The researchers found that specific prompts increased the level of metacognitive learning activities and diversity of the learning strategies compared to "non-specific" prompts.

Clearly, the type of reflection prompts seems to have an impact on how effectively students learn. Yet, prior evidence on whether generic or specific prompts work better is inconclusive. When they are combined with *adaptable* CSS, we however assume that specific prompts should work better, as they may lead learners to reflect about their learning process before making a decision on how to adapt the CSS. This, in turn, may lead to more adequate adaptation decisions.

Research Questions and Hypotheses

Building on the aforementioned considerations, we found the possibility of helping students acquire knowledge crucial to assessing child welfare cases in a structured CBL environment worth examining. Using guiding questions of the general normative action theory (Obrecht, 2007), we expected to draw students' attention to particular steps of conducting an assessment like describing a situation, reconstructing a case history, defining a problem, setting goals of an intervention, and decision making. With research underlining the benefits of adaptability in other fields, we wanted to understand if frequently making use of the opportunity to adjust one's CSS to the perceived needs would improve students' knowledge acquisition. We also wanted to understand the relationship between certain steps of assessment and knowledge acquisition. The aim of our study was to analyze whether effects of CBL can be augmented with *adaptable* CSS and different kinds of metacognitive prompts. More specifically, we asked the following research questions:

RQ1: Does offering students with additional guidance during case-based learning foster their acquisition of different kinds of knowledge crucial to assessment?

We expected students in a guided case-based learning setting (GCBL) to acquire more knowledge than counterparts in an unguided cased-based learning setting (UCBL), given the possibility of channeling attention to what needs to be done during assessment in the aforementioned group (H1).

RQ2: What are the effects of different types of CSS (*adaptable* vs. *strict*) and metacognitive reflection prompts (specific vs. generic) as well as their different combinations on the acquisition of the knowledge facets crucial to assessment?

With research suggesting that *adaptable* CSS can be beneficial in fostering autonomy, which is crucial in learning, we expected them to improve knowledge acquisition more effectively than *strict* CSS (H2a). Further, as specific metacognitive reflection prompts offer precise direction about what needs to be reflected about between assessments, which in turn should lead to better adaptation decisions, we expected them to foster knowledge acquisition more effectively than generic prompts (H2b). We further anticipated that combining *adaptable* CSS and specific reflection prompts should lead to the best results (H2c).

We additionally raised an exploratory research question to gain more insight into what adaptation processes would relate to knowledge acquisition. More specifically, we asked:

RQ3: What is the relation between the extent to which students in the *adaptable* CSS actually use the opportunities to adapt the CSS and the acquisition of the knowledge facets crucial to assessment?

Method

Participants and design

We collected data from $N = 104$ social work students (82% female, $M_{age} = 27.13$, $SD_{age} = 7.57$) from five different universities of Applied Sciences in Germany. Participation was voluntary, and students received an incentive afterwards. Prior to the study, all students signed a consent

form explaining data collection and use, possibilities of publication, and data security. To test our hypotheses, we randomly assigned participants to one of five conditions (see table 1). One group represented a control condition in which students neither received CSS nor prompts, i.e., they learned in an unguided CBL environment in which they solved cases without additional scaffolds. The four remaining experimental conditions originated from the four cells of a 2*2-factorial between-subjects design with the independent variables CSS (*strict* vs. *adaptable*) and metacognitive reflection prompts (generic vs. specific). To answer RQ1, the control condition was compared to the four other experimental conditions together. To answer RQ2, RQ3, and RQ4, only the conditions of the 2*2-factorial design were compared (i.e., the control condition was dropped).

Table 1

Design of the empirical study.

		Guided case-based learning (GCBL)		Unguided case-based learning (UCBL)
		Type of computer-supported script		
		Strict script	Adaptable script	
Type of Metacognitive Prompts	Generic prompts	*n*=20	*n*=18	
	Specific prompts	*n*=23	*n*=24	
				n=16

Learning environment, material, and resources

We created an online CBL environment with the software Unipark and incorporated four vignettes to stimulate engagement in an assessment of a child abuse case. The vignettes were approved by a social work professor and two social workers in the field of child welfare who were asked to check for comprehensibility and closeness to real life situations prior to the study. They had pointers of child abuse with differing severity. Following a pilot study with 5 social work students, final adjustments were made. Additionally, we included a simplified version of the law book regulating issues of child welfare and protection in Germany as an additional source of information.

Procedure

In total, the study consisted of seven stages (see table 2) with a total duration of 90 minutes:

1. Pretest: First, all participants filled in a questionnaire on their demographic data. Next, they received a short case vignette for which they were asked to write down the steps that they would conduct and what they would pay attention to.

2. Video presentation: The students got to see a voice-over presentation of the general normative action theory (Obrecht, 2007) and how it could be used as a model for conducting social work assessments.

3. First treatment case: All students received a new case to analyze. Unlike students in the unguided setting who were asked to write down their assessment in an open text box, all students in the guided treatment setting received a *strict* CSS to guide their analysis.

4. Reflection phase: After the first treatment case, students in the four guided conditions were prompted to reflect about the previous assessment.

5. Planning: Students were asked to plan their problem-solving strategy for the third assessment. In the *adaptable* CSS setting, students could choose the steps for which they felt they needed support (see below). In the *strict* CSS setting, students were asked to write down their planned problem-solving strategy in an empty text box.

6. Second treatment: Subsequently, all participants received a third case that they analyzed in their respective experimental conditions (with an *adaptable* or *strict* CSS).

7. Post-test: Similar to the pretest, students received a further case vignette for which they were asked to write down the steps that they would conduct and what they would pay attention to in each of these steps.

To control for task difficulty in the pre and post-test as well as during the first and second treatment, the presentation sequence of the vignettes was counterbalanced.

Table 2

Overview of study procedure and tasks

Phases	Conditions	Task
Pretest	All conditions	Questionnaire on demographic data and prior knowledge test on assessment
Intervention	All conditions	Voice-over presentation
First treatment	UCBL condition	Assessment of vignette 1 without guidance
	All GCBL conditions	Assessment of vignette 1 with strict script
Reflection	UCBL condition	………………………
	GCBL conditions.	
	AG and SG	Open reflection about assessment of vignette 1
	AS and SS	Reflection on what was hard or easy assessing vignette 1
Planning	UCBL condition	………………………….
	GCBL conditions.	
	AG and SG	Choosing steps for which help is needed for assessment of vignette 2
	AS and SS	Planning steps of assessment on vignette 2
Second treatment	UCBL condition	Assessment of vignette 2 without guidance
	GCBL conditions.	
	AG and AG	Assessment of vignette 2 with an adaptable script
	SG and SS	Assessment of vignette 2 with a strict script
Posttest	All conditions	Post knowledge test on assessment

[a] UNCBL = Unguided case-based learning, [b] GCBL = Guided case-based learning

[c] AS = Adaptable scripts and specific metacognitive prompts, [d] SG = Strict script and generic prompts

[e] AG = Adaptable scripts and generic prompts, [f] SS = Strict scripts and specific prompts

Independent variables

Type of CSS

The type of CSS was varied in the second treatment phase (see above). In the *strict* CSS condition, students were guided through the stages of conducting an assessment describing a situation, defining the problem and context of risk, clarifying goals of a possible intervention, and making a decision about how to proceed. To support students in their assessment process, they received guiding questions and hints for each of these steps (see left part of fig. 1). An example of such a question and cue (scaffolding risk assessment) was: "What is more likely to happen if the social worker doesn't intervene?", followed by the cue "With this question, you can contextualize the context of risk and examine the need for immediate intervention or none". For the first case, students from all four GCBL conditions received this CSS. For the second case, students from the *strict* CSS condition continued with the same kind of support.

In contrast, after the analysis of the first of the two cases, students from the *adaptable* CSS condition were asked to actively adapt the CSS, i.e., they had the opportunity to select the steps of assessment for which the guiding questions and hints should be displayed to them when analysing the second case (see right part of fig. 1).

Figure 1

Screenshots of strict vs. adaptable scripts. Left: strict script with question scaffolding risk

assessment; Right: phases for which students could select to receive support.
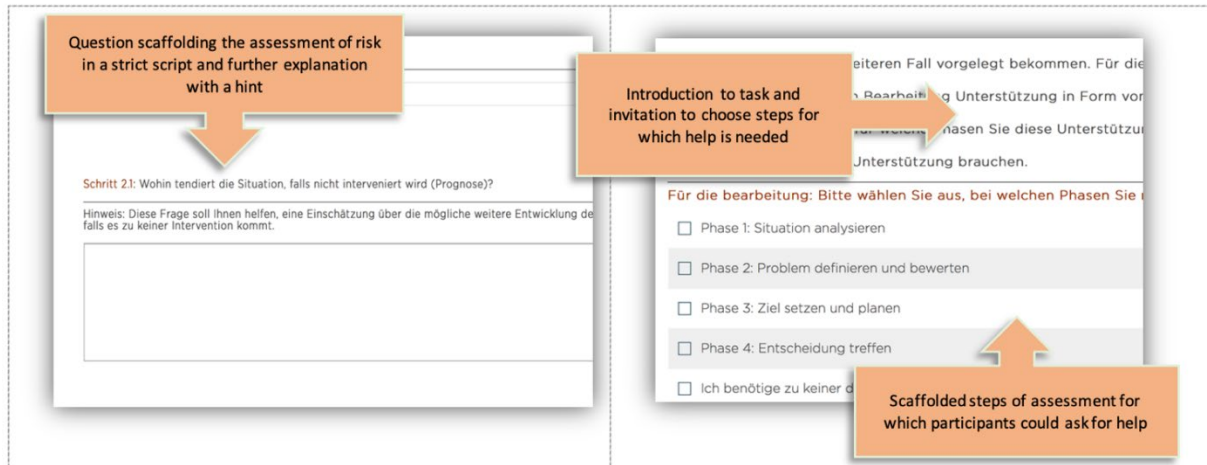
Type of metacognitive prompts

Before the second treatment and the option to adapt the CSS, students in the GCBL conditions

were introduced to the second independent variable: the type of metacognitive prompts.

Students in the specific prompt condition received two questions: "What was hard for you to

do during the last assessment?" and "What was easy for you to do during the last assessment?"

and were asked to react to these prompts in two text fields. In the generic reflection prompt

condition, students were asked to reflect about their assessment process in one open text box,

without further guidance on what or how exactly to reflect.

Dependent variables

Post-test knowledge facets

The dependent variable was "knowledge facets for assessment" We used the categories

introduced earlier on for measurement (see theoretical background). As described in the

procedure, students received a case for which they were prompted to write down the steps that

they would take and what they would pay attention to (for each) if they were the responsible social worker during the pre and post-test. The prompts were:

In step 1, I would …

In this step 1, I would pay attention to…

We created a binary coding rubric (knowledge component present= 1, knowledge component not present= 0) to examine the students' case analyses. The responses to the two prompts ("I would…" and "I would pay attention to…") were combined into a single coding unit. Concepts, facts and principles were categorized as elements of conceptual knowledge. Actions and procedures were characterized as strategic knowledge. Argumentation structures (semantics) and connections between actions and concepts were characterized as reasoning (see table 3 for example statements and coding).

Table 3

Examples of declarative statements with respective coding

Knowledge facet	Exemplary statement
Conceptual knowledge	I would check whether there is a risk to the wellbeing of the child as regulated by *the law §1666 (1) BGB*. Therein, *risk to the well-being of the child may be of physical, psychological or emotional nature.*"
Strategic knowledge	I would *get in touch with my colleagues* to review the case, *conduct a risk assessment* and *have one of us visit the family*.
Reasoning	I would *make sure that the colleague is safe by informing the police and the family court prior to the visit*.

Two independent coders who were blind to condition examined 10 % of the data. Inter-rater agreement after the training and coding rounds amounted to a Cohen's kappa of $\kappa = .70$ for conceptual knowledge, $\kappa = .76$ for strategic knowledge, and $\kappa = .70$ for reasoning. Thus,

interrater agreement was acceptable (Landis & Koch, 1977). The remaining 90 % of the data were then coded by one coder.

Adaptation of CSS

As described, in the *adaptable* CSS setting, between the first and second treatment case, students could choose the steps for which they did (or did not) need help. To measure the amount of adaptation students used, we created a total out of the number of times that the students adapted their CSS (shutting down the option of having guide questions and hints for the respective steps of assessment shown). We used the resulting score to examine the relationship thereof to knowledge acquired in the post test.

Control variable

We coded the analyses of the first vignette with the binary coding rubric to assess participants' prior knowledge of assessment. Having found a statistically significant difference in prior knowledge between in the experimental conditions, $F(1,84) = 4.56$, $p = .036$, $\eta p^2 = .052$, we used the pretest scores as an objective measurement of knowledge prior to the intervention as a control variable.

Statistical analyses

To answer RQ1, a multivariate ANCOVA with the three facets of knowledge (conceptual knowledge, strategic knowledge and reasoning) as dependent variables was performed to compare the students who received guidance during CBL (i.e., participants from the four experimental conditions of the 2x2-factorial design) with students who did not (the control condition in table 1). To answer RQ2, the effects of the CSS, metacognitive reflection prompts as well as their interaction on the acquisition of different facets of assessment skills were examined by univariate two-way ANCOVAs with the single skill facets conceptual knowledge, strategic knowledge, and reasoning as dependent variables. Regarding RQ3, we ran linear

regressions with the number of times that students in the *adaptable* CSS condition actually adapted the CSS as predictor and the knowledge facets as measured in the post-test as criterion variables (an SPSS syntax is available at https://osf.io/2jrza/). For all analyses, we set the alpha level to .05.

Results

RQ. 1 Guided (GCBL) vs. unguided case-based learning (UCBL)

RQ1 asked whether students in the GCBL environment would perform better than students in the UCBL environment. Descriptives (see table 4) showed that students from the GCBL condition reached higher scores regarding conceptual knowledge, but lower scores regarding strategic knowledge and reasoning than their counterparts in the UBCL condition.

Table 4

Means and standard deviations of the three knowledge types in the guided and unguided case-based learning conditions

	Guided case-based learning (GCBL)		Unguided Case-based learning (UCBL)	
	M	*SD*	*M*	*SD*
Conceptual knowledge	2.12	2.08	.87	.719
Strategic knowledge	3.59	2.40	4.87	2.68
Reasoning	2.22	2.00	3.38	3.01

Results of a multivariate ANCOVA (with the three knowledge components as dependent variables, guidance as independent variable, and prior knowledge scores as covariate) showed

a large and statistically significant effect of guidance, $F(3, 99) = 6.775$, $p < .001$, Wilks' $\Lambda = .830$, $\eta p^2 = .170$.

Looking at the three knowledge facets separately, a significant main effect of medium size for guidance, $F(1,101) = 7.724$, $p = .007$, $\eta p^2 = .071$, was observed on the acquisition of conceptual knowledge, indicating that students in the GCBL condition performed better than their counterparts in the UCBL group. The (negative) effect of guidance on the acquisition of strategic knowledge was small and marginally significant, $F(1,101) = 2.88$, $p = .092$, $\eta p^2 = .028$. Also, the (negative) effect of structure on the acquisition of reasoning was small and marginally significant, $F(1,101) = 2.82$, $p = .096$, $\eta p^2 = .027$. With students in the GCBL acquiring better scores, but only in one knowledge component (conceptual knowledge) and an opposite tendency in the other two components (strategic knowledge and reasoning), our hypothesis was only partly confirmed.

RQ. 2 Effects of adaptable vs. strict CSS and specific vs. generic metacognitive reflection prompts on knowledge facets

To answer RQ2, we compared the post-test knowledge scores in each of the four GCBL conditions that differed from each other regarding type of CSS (*strict* vs. *adaptable*) and metacognitive reflection prompts (generic vs. specific). Descriptive statistics can be seen in table 5.

Table 5

Means and standard deviations of the three knowledge types across the four experimental conditions.

	Adaptable CSS/ generic prompts		Adaptable CSS/ specific prompts		Strict CSS/ generic prompts		Strict CSS/ specific prompts	
	M	*SD*	*M*	*SD*	*M*	*SD*	*M*	*SD*
Conceptual knowledge	2.80	2.24	2.17	2.02	2.43	2.27	1.25	1.60
Strategic knowledge	3.80	2.19	4.26	2.75	3.38	1.99	2.96	2.48
Reasoning	2.60	1.68	2.52	2.23	2.10	2.10	1.71	1.92

Conceptual knowledge

An ANCOVA with the type of CSS and the type of metacognitive reflection prompts as independent variables, conceptual knowledge in the posttest as dependent variable, and prior knowledge as a covariate revealed a medium-sized, statistically significant main effect of type of reflection prompts, $F(1,83) = 4.56$, $p = .037$, $\eta p^2 = .052$, surprisingly indicating that students in the generic prompts condition performed better than their counterparts in the specific prompts condition. The main effect of CSS on the acquisition of conceptual knowledge was non-significant, $F(1,83) = .758$, $p = .387$, $\eta p^2 = .009$. Also, the interaction effect was non-significant, $F(1,83) = .513$, $p = .476$, $\eta p^2 = .006$. Thus, for conceptual knowledge, we found contradictory evidence with respect to H2b, and no evidence for H2a and for H2c.

Strategic knowledge

For strategic knowledge, an ANCOVA with the type of CSS and the type of metacognitive reflection prompts as independent variables, strategic knowledge in the post-test as dependent

variable, and prior knowledge as a covariate yielded no statistically significant effect of CSS on strategic knowledge, $F(1,83) = 1.356$, $p = .247$, $\eta p^2 = .016$. The main effect of metacognitive reflection prompts was also non-significant, $F(1,83) = .005$, $p = .944$, $\eta p^2 = .000$. Students who learned with the combination of *adaptable* CSS and specific prompts descriptively acquired higher levels of strategic knowledge in the post test compared to those who learned with the combination of *strict* CSS and specific prompts. Yet, also the interaction effect was non-significant, $F(1,83) = .868$, $p = .354$, $\eta p^2 = .010$. Therefore, regarding strategic knowledge, we found no support for H2a, H2b and H2c.

Reasoning

A further ANCOVA with the type of CSS and the type of metacognitive reflection prompts as independent variables, reasoning in the post-test as dependent variable, and prior knowledge as a covariate also failed to reveal a main effect of CSS, $F(1,83) = .869$, $p = .354$, $\eta p^2 = .010$, as well as the type of prompts $F(1,83) = .278$, $p = .599$, $\eta p^2 = .003$, even though students in the *adaptable* CSS conditions descriptively acquired higher levels of reasoning compared to their counterparts in the *strict* CSS conditions. Also, the interaction effect was non-significant, $F(1,83) = .183$, $p = .670$, $\eta p^2 = .002$. Thus, also for reasoning, we found no support for H2a, H2b and H2c.

RQ 3: Relationship between adaptability and knowledge acquisition

A linear regression revealed that the average number of times that students in the *adaptable* CSS condition actually adapted the CSS significantly predicted conceptual knowledge gain during the post-test, $F(1,39) = 5.79$, $p = .021$. More specifically, the frequency of actual adaptations accounted for 10.7 % of the variation in levels of conceptual knowledge acquired in the post test. However, the average number of times that students in the *adaptable* CSS

condition actually adapted the script neither predicted the acquisition of strategic knowledge, $F(1,39) = .716$, $p = .402$, nor reasoning $F(1,39) = 1.383$, $p = .247$.

Discussion

The aim of our study was to examine how computer-supported CBL could be used to support social work students to acquire knowledge crucial for the assessment of cases of child welfare and whether benefits of CBL could be maximized by structuring the learning process with CSS (*adaptable* vs. *strict* scripts) and metacognitive reflection prompts (generic vs. specific).

For our first research question, we found that structuring CBL had an overall large effect on knowledge students displayed in the post test. Yet, we only found a positive effect (of medium size) with respect to conceptual knowledge, indicating that students in the GCBL environment reached higher conceptual knowledge scores in the posttest as compared to their counterparts in the UCBL environment. This positive (and not small) effect of GCBL on conceptual knowledge can be regarded as encouraging, as it shows that structured computer- supported CBL (Kolodner, 2014) can have positive effects on the acquisition of knowledge for assessment. This adds to previous evidence collected in other areas such as medicine (see Kopp et al., 2009).

Taking the complexity of assessing child welfare cases and the short duration of our intervention into consideration, conceptual knowledge can be perceived as an indicator of the first stages of learning. Yet, the slightly, albeit small and only marginally significant negative effects of GCBL on strategic knowledge and reasoning indicate that the positive effects of guidance on conceptual knowledge may go a bit at the expense of the acquisition of these more complex knowledge facets. Given the small effect sizes, the practical relevance of these effects may however be limited. Nevertheless, it is disappointing that we found no evidence of positive effects of GCBL on strategic knowledge and reasoning in the expected direction whatsoever. Further research should therefore try to find ways how also these two knowledge facets can be

effectively supported, especially since strategic knowledge and reasoning can be regarded as the more advanced knowledge facets that are necessary for competent child welfare assessment. While designing scaffolds that directly address these knowledge components is certainly important, we should also note that gaining proficiency with respect to all three knowledge types congruently simply might require more time. As we only realized a short-term intervention, further research should implement GCBL within longer time frames to see whether beneficial effects on strategic knowledge and reasoning appear in the longer run.

A closer look at the single GCBL conditions (RQ2) revealed generic metacognitive reflection prompts to be significantly more effective than specific prompts in fostering conceptual knowledge. The corresponding effect, which was contrary to our hypothesis, was of medium size, thus showing quite some practical relevance. The benefits of the generic prompts might be explained by Davis' (2000) observation that metacognitive prompts which fostered the integrated understanding of ideas provided room for students to monitor progress and identify new connections. In line with Guo (2022) and Davis (2000), it might have been the case that the specific prompts we used were not precise enough or may have limited engagement in other of the aforementioned activities. In the generic prompt condition, students might have benefited from the open opportunity to reflect about the goals of the task, their learning process and their problem-solving strategies. Further research would be needed to test our interpretation.

Whether the CSS that students learned with was *strict* or *adaptable* did not seem to matter for the acquisition of the three knowledge facets. Our expectation that *adaptable* CSS would significantly contribute to improved knowledge acquisition could thus not be confirmed. Yet, it should be noted that the more flexible CSS (i.e., the *adaptable* CSS) was not inferior to the *strict* CSS, which implies that using *adaptable* CSS does not seem to be a bad idea to support social work students in their acquisition of knowledge crucial for assessment. Our results

regarding RQ3, which demonstrated that a more intensive actual use of the opportunity to adapt the CSS actually was connected with an increased acquisition of (at least) conceptual knowledge, further indicates that the effects of *adaptable* CSS might even be increased when students are more effectively supported in using these opportunities. Yet, also here, further research is necessary.

Also of interest was that combining CSS with prompts did not have a more visible impact on the acquisition of knowledge than any of the single scaffolds alone, contrary to what we anticipated. Potential benefits of combining CSS and prompts might have represented what Dillenbourg (2002) and others referred to as "overscripting". With the CSS breaking down assessment into a "sequence of tasks", it might have interrupted the natural problem-solving process and also contradicted the way students are usually taught (approaching assessment as a non-sequential process).

Limitations and conclusions

Of course, our study does not come without limitations. First, students' declarative responses were used to measure knowledge acquisition in the post-test. It should be treated with caution that students' claims about what they would do in a given situation do not necessarily imply their ability to transfer acquired knowledge to practical situations. Second, assessing cases of child welfare is typically a process that needs time. We used vignettes in our study and we acknowledge the concern that has been voiced that they tend to reduce complexity (Gautschi, 2021). Typically, child welfare assessments would be done following interaction with different parties, for example involving parents and colleagues. Our design could not provide for this with its limited time frame and the focus on individual student's processes. Conducting the intervention over a longer period (like a semester) and with various practice opportunities might be needed to yield more pronounced effects. Also, it should be noted that some of the effects we found were rather small. It is thus a question for future research to investigate the

stability of these effects, and in particular, whether they will also materialize in less controlled settings. Finally, it should be noted that our sample size was rather small. Thus, further research with larger samples is needed.

Despite these limitations, our study seems to indicate that guided case-based learning is a promising approach to be used in social work education. While it may not be possible to prepare students for all situations likely to be encountered during assessment of child welfare cases, social work educators can use this teaching approach to foster a systematic way of solving problems. They can also design guided case-based learning environments to foster different skills crucial to assessment like critical thinking.

Case-based learning has for long been used to stimulate engagement in social work, and our research provides evidence that for online learning environments, providing structure can be effective. Scaffolding can be a way of fostering scientific practice by channelling focus to key social work concepts. Yet, further research is needed with respect to the question what kinds of additional scaffolds should be integrated into online CBL environments.

With respect to generalizability, the extent to which our results are transferable to other areas in social work is questionable (taking into consideration that the study was conducted in a specific context). An interesting and important aspect might be whether CBL, CSS and metacognitive prompts also work for social work professionals, for example. Empirical research from learning with multimedia indicates that with more expertise, learners might benefit from less external guidance (expertise-reversal effect; Kalyuga, 2007). Yet, for such more competent learners, providing the possibility to adapt the external support they receive, as we did in our study, might be especially promising.

Overall, this study being amongst the first engaging with the use of *adaptable* CSS and metacognitive reflection prompts to train assessment in social work, provides preliminary evidence that structuring CBL contributes to knowledge acquisition.

Disclosure statement

The authors do not have any conflicts of interest.

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7. **Empirical Study II**

Social Work Students' Reflection about Conducting Child Welfare

Assessment in a Guided Case-Based Learning environment:

Opio, M., Kollar, I. & Dorner, B. Social work students´ reflection about conducting child welfare assessments in a guided case-based learning environment. Manuscript submitted for publication in Social Work Education (https://www.tandfonline.com/journals/cswe20), on May 11th 2023

Social Work Students' Reflection about Conducting Child Welfare Assessment in a Guided Case-Based Learning Environment

To understand how guided case-based learning (GCBL) can be integrated into social work education, it's important to explore how this can be done effectively and to engage with how students perceive such learning environments. As most GCBL research is outside social work, we conducted a 2*2 quasi-experiment to examine both. GCBL was found to be an effective teaching tool for child welfare assessments according to a quantitative analysis. This paper examines how students reflect on their learning experiences. We used a qualitative content analysis to investigate what they perceive as helpful or hindering conducting assessment in a GCBL environment. Furthermore, we wanted to know what they attribute perceived difficulty to. We evaluated N = 70 students' responses from five different Bavarian universities. Findings showed that, GCBL was shown to be well received by some students. GCBL features like scaffolding questions helped students focus on key assessment aspects. Nonetheless, breaking down the exercise into smaller stages was perceived as an interference in problem solving by some. GCBL potential can be improved by paying attention to instruction clarity and incorporating interaction and feedback possibilities.

Keywords: assessment, case-based learning, social work education, child welfare, computer supported scripts, metacognitive prompts

Social Work Students' Reflection about Conducting Child Welfare Assessment in a Guided Case-Based Learning Environment

Problem statement

When social workers assess child welfare cases, information is often uncertain and incomplete (Killick & Taylor 2020). Yet, social workers need to learn how to engage with such information critically in order to make important decisions that might affect children and families. As (Effinger, 2021) points out, social work educators should provide opportunities for students to develop their ability to handle uncertainty. Given the complexity, fostering reflection, i.e., the ability to think consciously and systematically about decisions made, on which grounds and the consequences in relation to outcomes is crucial (Egonsdotter et al., 2020) It is possible to engage students with scenarios likely to be encountered in practice using authentic cases (Austin & Packard, 2009; Egonsdotter & Bengtsson, 2022). Research also suggests that practice skills can be fostered effectively with digital means (Cummings et al., 2019) but such learning environments can be overwhelming for students. Introducing structure into digital learning environments can help students acquire skills without overwhelming them with complexity. Computer-supported scripts (CSS) provide learners with guidance on when, how, and in what order to perform certain tasks and can be integrated into digital learning environments (Author, et al., 2006). As an example, a script can sequence the activities of an assessment in a Case-Based Learning (CBL) environment. CSS can be used to support students' assessment processes and to prompt them to reflect about their learning.

In light of this, most research on CSS is outside of social work. Understanding how CSS can be incorporated into digitally supported CBL for social workers' education does not only require examining how this can be achieved effectively (Authors et al., in press), but also engaging with how learners perceive this learning experience (perceptions on the topic being taught, features integrated into the learning platforms and other factors that seem to influence

their learning process). In order to gain a deeper understanding of the latter, we conduct a qualitative content analysis, systematically examining explicit and latent meanings of what students perceive as helpful or hindering, what they attribute their perceived difficulty to and what they generally pay attention to working in a GCBL environment.

Conducting child welfare assessment in social work

Uncertainty of information, ambiguous definitions, and the dynamic nature of risk make child welfare assessments complicated (Gambrill & Shlonsky, 2000; Killick & Taylor 2020) In most cases, social workers may never have all the information they need to assess child welfare cases and they may never know for sure whether the information they have is accurate (Killick & Taylor 2020) Given the purpose that assessments serve and the consequences of erroneous decisions (Munro, 1999c) they must be "focused, factual, and explicit" (Parker, 2020, p.20). Entrusted with the responsibility of making significant decisions that impact clients' lives based on incomplete and complex information, it is important to take uncertainty and subjectivity into account (Killick & Taylor 2020). The overall goal is to gain a deeper understanding of the client's world even with the hindrances (ibid.)

According to Holland (2010) paying attention to the experiences and narratives of children and families is crucial. Assessment transcends the act of gathering information. Rather than viewing the collected data as "face value", it requires critical engagement with the data in order to build a comprehensive picture of the people at the center of the social work process (Killick & Taylor, 2020). When dealing with issues like mental health, domestic violence, or substance abuse, integrating expert knowledge and applying a theoretical approach are equally significant (Holland, 2010).

Knowledge frameworks usually identify specific domains and sub-elements of what has to be taken into account during assessment (Killick & Taylor, 2020). Theories and knowledge frameworks integrated therein help social workers make informed opinions (Milner et al.,

2020). In German-speaking social work, one such framework is Obrecht's (2007) "general normative action theory" which structures the process of data collection and helps making predictions, explaining problems, and choosing interventions that are legitimate and appropriate in an ethical way (Spensberger, 2019) Obrecht's action theory is a fundamental element of the Swiss School of Social Work's systemic paradigm, an overarching framework under which different theoretical models are integrated (Obrecht, 2005; Staub-Bernasconi, 2018).

According to Obrecht, professional problem solving is rational, structured, theory-driven, and ethical (2007). The general normative action theory includes the steps: (1) describing the situation (Who is involved? What has happened?), (2) reconstructing the case history (What happened in the past and how has it contributed to the current situation?), (3) examining the context of risk (Is there a need for immediate action? What is likely to happen without action?), (4) defining the problem (What are social norms and how is the current situation a deviation therefrom? What would be ethical?), (5) examining goals of possible intervention (How and what needs to be done and with which resources?), (6) making a decision (What might be a suitable intervention and what it might achieve?) and (7) evaluation. As such, these steps are not linear but rather iterative (Staub-Bernasconi, 2018).

While such frameworks may not guarantee success of social work interventions, they hold the potential of enhancing the social work process by drawing attention to issues that matter most, showing how information can be organized and interpreted based on all of which reasonable judgements can be made (Killick & Taylor, 2020, p. 37). Yet, according to Crisp (2004), tools and frameworks for assessment might offer orientation for teaching and practice but come with the danger of limiting transferability (Crisp, 2003). With the focus put on particular settings and particular client groups, frameworks may trigger a form of trained

incapacity in which acquired skills and knowledge cannot easily be put to use with other groups of clients or settings (Whittington, 2005).

While there are different suggestions about how assessments ought to be taught in social work education, there seems to be agreement that providing for practice opportunities that enable students to actively apply the knowledge acquired theoretically is relevant (Crisp et al, 2004; Whittington, 2005). Also, providing room for students to think more systematically and consciously about their decisions during practice is crucial (Egonsdotter & Bengtsson, 2022). In contrast to professionals, students' reflections rarely relate to real-life social work experiences (ibid.) So besides helping students gain first-hand understanding of how to apply such knowledge frameworks, they can be supported in this area, and this can be achieved with CBL.

Case-based learning (CBL) as an approach for teaching assessment in social work

Constructivist educational approaches combine cognitive theories with classroom practices to elicit students' participation in processes such as collecting data, generating hypotheses, evaluating pertinent information for problem solving, or conducting realistic analysis or inquiry (Kolodner et al.,1996). Similar to problem-based learning and inquiry learning, CBL is an example of the so-called constructivist educational approaches that are prominent in teaching social work assessments (Whittington, 2005). Austin and Packard (2009) also underline that using cases to teach seems to have a long tradition in social work.

Longhofer et al. (2017) observe that when it comes to social work and other helping professions, daily practice rotates around complicated cases and the successful execution and completion of these reconciles professional accountability. Learning with cases makes it possible to (re-)enact experiences encountered in daily practice like dilemmas, emotions, misinterpretations and motivation of involved actors which prompts students to use various

problem-solving strategies (Dowd & Davidhizar, 1999). Teaching with authentic cases provides students with opportunities of combining theory and practice while learning from scenarios most likely to be encountered in their future practice (Bauer et al., 2022; Fischer et al., 2022). With cases, complete scenarios or partial elements thereof can be enacted and representation can be done with different medial means like texts, audios or videos (Fischer et al., 2022).

CBL has often been implemented by aid of computer-based technology. In social work education, Egonsdotter and Bengtsson (2022) found that learning with cases in a computer-based simulation environment fostered reflection and understanding of social problems from multiple perspectives. Also, (Authors, et al., in press). provides evidence that digital CBL in social work is a promising way of equipping students with knowledge crucial for the assessment of child welfare cases. In medical education, cases have been found to be effective in fostering active learning and the acquisition of skills like clinical problem solving (also collaboratively), critical thinking, or ethical decision-making (Dinç & Görgülü, 2002; Harman, et al., 2014; Kopp, et al., 2014; Popil, 2011; Radkowitsch, et al., 2022).

Offering guidance to make CBL effective.

Even with the benefits that learning with cases has, the learning process can be overwhelming for students. Providing enough time for preparation as well as additional support when working on cases may be relevant (Baeten et al., 2013; Kolodner & Hmelo, 1996). One way of doing so would be with the help of computer-supported scripts which are scaffolds offering guidance regarding when, how, and in what sequence to perform particular tasks (Authors, et al., 2006). In the case of child welfare assessment, the process can be broken down into different components like 1) describing the situation (Who is involved? What has happened?), (2) reconstructing the case history (What happened in the past and how has it contributed to the current situation?), (3) examining the context of risk (Is there a need for immediate action? etc.

Students can be guided through these different stages with instructional support pointing their focus to these tasks.

There is evidence supporting the effectiveness of scripts. Vogel et al. (2017) show in a meta-analysis that scripts foster the acquisition of domain specific knowledge and collaboration skills. Also, Author et al. (in press) conducted a 2*2 quasi experiment and randomly assigned the students to one of the conditions: computer support scripts (adaptable vs. strict scripts), metacognitive reflection prompts (generic vs. specific) or a control group. Students in the Guided CBL environment acquired better conceptual knowledge scores compared to counterparts in the unguided CBL environment.

Another way of offering guidance in a CBL environment could be with help of metacognitive prompts. Incorporated into a learning environment, these are scaffolds that stimulate and support students' cognitive, metacognitive, motivational, and collaboration skills by asking them to perform certain metacognitive actions such as planning, monitoring, and reflecting on their learning process (Bannert, 2006; Bannert & Reimann, 2012). The usefulness of metacognitive prompts has been demonstrated by Davis (2003), who examined if scaffolding was necessary to assist students learn how to" reflect productively" which could lead to knowledge integration (expand, distinguish, and connect ideas as well as recognize weaknesses in one's knowledge). Davis' findings show that the type of metacognitive prompts mattered, citing differences on how precise directions for reflection were written.

When it comes to support in digital based environments, research shows that offering too much guidance ("overscripting"; Dillenbourg, 2002) might limit students' self-regulation and active engagement, which might affect learning motivation in a negative way (Mäkitalo et al., 2005; Rummel, et al., 2009). According to Renninger et al. (2019), motivation refers to both engagement and interest alongside others. Interest is the meaningful, long-term engagement with content, people's psychological state during engagement, and the likelihood of continuing

to do so (ibid). Therefore, it is a central factor in academic situations (Harackiewicz et al., 2016).

In response to detailed scripts possibly having a negative effect on learning, research has addressed ways of making scripts "flexible" (Dillenbourg & Tchounikine, 2007) suggesting adaptability as one possible way of doing so. With adaptable scripts, students are entrusted with the task of making adjustments to the script to cater for their own perceived learning needs (Plass & Pawar, 2020; Wang et al., 2017). Digital learning tasks that provide structure and support autonomy have a positive effect on both motivation and learning outcomes (Van Loon et al., 2012)

Study context

We conducted a 2*2 quasi experiment study and randomly assigned the students to either a Guide Case-based learning (GCBL) condition or a control group. In the GCBL condition, following elements, were manipulated: computer support scripts (adaptable vs. strict scripts), metacognitive reflection prompts (generic vs. specific)

In the GCBL environment, students were guided through the assessment process unlike in UGCBL. Results of a quantitative analysis revealed students in the UGCBL environment to have acquired better levels of conceptual knowledge in the posttest (Authors, in press). Differences between the groups in the experimental conditions were but small. In this paper, we examine how students reflect about conducting child welfare assessments in a GCBL environment. Students had a reflection task between the assessment process (see table 1 for details on the procedure of the experiment and the respective tasks).

Table 1

Overview of study procedure and tasks

Phases	Conditions	Task
Pretest	All conditions	Questionnaire on demographic data and prior knowledge test (short assessment without guidance)
Intervention	All conditions	Voice-over presentation
First treatment	UCBL condition	Assessment of vignette 1 without guidance
	All GCBL conditions	Assessment of vignette 1 with guidance
Reflection	UCBL condition	………………………
	GCBL conditions.	Open reflection about assessment of vignette 1or
		Reflection on what was hard or easy assessing vignette 1
Planning	UCBL condition	…………………………….
	GCBL conditions.	Choosing steps for which help is needed for assessment of vignette 2 or
		Planning steps of assessment on vignette 2
Second treatment	UCBL condition	Assessment of vignette 2 without guidance
	GCBL conditions.	Assessment of vignette 2 with guidance
Posttest	All conditions	Post knowledge test on assessment (short assessment without guidance)

[a] UNCBL = Unguided case-based learning, [b] GCBL = Guided case based learning

Depending on the experimental condition, they were either prompted to write about this in an open text box or received two guiding questions "What was hard for you to do during the last assessment?" and "What was easy for you to do during assessment?". With differences

between groups being small in the quantitative analysis, we refrain from making comparisons in this paper and employ a qualitative content analysis to examine students' responses during the reflection phase. We raised the following research questions: How do students describe their experience of conducting child welfare assessments in the GCBL environment? What elements do they pay attention to, and which factors do they find to be helpful or hindering?

Method

Participants

We collected data from $N = 104$ social work students from five different universities of Applied Sciences in Germany in the main study. Their participation was voluntary, following which they received an incentive. Participants were undergraduate students in the final year. It is worth mentioning that the standard length of a Bachelor of Social Work degree in Germany is between 6 and 7 semesters. Thus, the participants were expected to have had classes on child welfare laws and protection prior to the study. All participants signed a consent form explaining data collection, use, publication possibilities, and data security. For this article, responses from $N = 70$ (82.9% female, $M_{Age} = 26.84$, $SD_{Age} = 7.091$) were evaluated. The remaining 34 students from the original sample were left out because they had not responded or not responded substantially to the reflection task (for example using few words that could not be put into context to answer the research questions).

Qualitative content analysis and ensuring methodological rigor.

Student reflections were analyzed by aid of qualitative content analysis (Kuckartz, 2014) following a 6 steps process: 1) preparing data, 2) creating main categories, 3) coding data according to these main categories, 4) compiling text passages of the main categories and developing further subcategories, 5) conducting a category-based analysis, and 6) presenting results (Kuckartz, 2019). Presented as a linear process, the steps are conducted in an iterative

and reflective way. This involves moving back and forth between the raised questions, the identified categories, making adjustments, and continuing fine-grained analysis and interpretation.

In qualitative research, the criteria of validity, reliability and objectivity are perceived differently as compared to quantitative research. According to Schreier (2012), validity is used in a comprehensive way, referring to the design of the entire study, the solidity of findings, and the conclusions drawn. Also, the quantitative perception of objectivity cannot be applied to qualitative research because meaning is conceptual and interpretation subjective (ibid.). Schreier further argues that the concept of reliability is approached from different angles in qualitative research. While some researchers argue for an approach in which consistency is achieved by using different coders (Silverman, 2001), others argue that working transparently and systematically through the data makes qualitative research reliable (Steinke, 2004). Przyborski and Wohlrab-Sahr (2014) overarchingly emphasize that without putting the emphasis on differences between research traditions, the decisive question in qualitative research should be on ways of achieving explicit quality criteria based on the reliability of data collection, the representativeness of the data selection, and the validity of generalized statements.

To address this, we paid attention to methodological rigor by reviewing our research design and the raised questions deeply. Regarding reliability, a preliminary "coding frame" (Schreier, 2012), was created in which coding units were defined as single sentences and a coding rule was established to proceed line by line. The coding manual and interpretations arising during the coding process were presented to an expert circle for feedback. To ensure consistency and reliability of the data analysis, time was left between the analysis sessions. For a better understanding of the data analysis, we would like to point out the use of the terminologies used in this paper. According to Rädiker and Kuckartz (2020) "categories usually consist of one

word or two-to-four-word combination" used for abstracting, indexing, reducing and therewith giving meaning to data (Kelle & Kluge, 2010). We use thematic categories to describe key topics and analytical categories to describe the results of a critical engagement with the thematic codes. In this article, we also choose to use the terms data-driven categories and concept-driven categories instead of deductive and inductive categories for preciseness.

Data preparation

Analysis was conducted using the MaxQDA program. Prior to coding, we familiarized ourselves with the data comprehensively, reading through all responses repeatedly. We generated "concept-driven categories" based on our study design and research questions. The "data-driven categories" i.e., students' responses were used to underline and strengthen the "concept-driven categories", and this process happened simultaneously at times. Constant adjustments (disintegrating and coming up with different categories) were made. Below, we present the main categories, subcategories, and examples of statements.

Defining the main thematic categories and subcategories

(1) Perceptions of assessing child welfare cases

Under this main category, we examined students' responses to assessing child welfare cases. Subcategories identified hereunder were (1) complexity, (2) connection, and (3) systems thinking. With the first subcategory(complexity), we looked at elements / aspects that students identified as difficult and what they attributed these difficulties to. An example of such a statement was: "*Due to the lack of practical experience, I am not certain the intervention I suggest would work or whether there would be better options*". With the second subcategory (connection), we looked at students' remarks on connecting the assessment exercise to previous experiences outside the GCBL environment. An example statement here was: "*This is a classic situation at the youth welfare office. It is difficult to determine what rights or claims the*

grandfather has as a reporting person…". The third subcategory (system thinking) was used to categorize students' remarks indicating that they could think and act systematically during the assessment process. An example of such a statement was: "*The more one goes through the questions, the more one focuses deeper on the parts, and how they connect to each other. Having a guiding system is good for gaining an overall impression and for keeping different elements in mind*".

(2)   Features of the GCBL environment

Students' responses to elements integrated into the GCBL environment were examined under this main category. We included three subcategories: (1) scaffolding, (2) intervention, and (3) case vignettes". With the first subcategory (scaffolding), students' opinions on the CSS and its guiding questions and hints used to break down the assessment process into stages were analyzed. An example of a coded segment here was: "*I was able to analyze the case easier and to make detailed recommendations for intervention with the help of the guide questions*".

Under the second subcategory (intervention), students' remarks on the voice-over presentation (explaining the "general normative action theory „and how it could be used to guide the assessment process) were examined. An example statement here was: "*…It was easier to proceed in this case because of the previous video, as the guiding questions provided a visual guide*".

 Last but not least, we used the subcategory "case vignettes" to engage with students' responses on the information provided in the cases and the format in which it was presented. An example statement here was: "*It was somewhat difficult to propose a more detailed plan of action since there was not enough background information provided…*".

(3)   Working conditions

In the main category "working conditions", we analyzed students' responses to the circumstances under which the assessment exercise in the GCBL environment was conducted. One subcategory we identified here with an example of statement being: *"Since these are cases that require a lot of time, the current timeframe seems tight"*. Another subcategory was technical know-how having perceived this as crucial for navigating the learning environment with confidence. An example statement for this was: "*I unfortunately pressed the submit button before my analysis was complete"*. It is however worth mentioning that this subcode did not have much prominence in our findings.

(4)   Motivation and interest

With this main category, we examined students' remarks on motivation and interest as factors that seemed to play a role working in the GCBL environment. Examples of such statements were: *"My interest in the area of child welfare is not strong so I am currently not so motivated"* and *"Taking a closer look at the case and assuming the role of a social worker was interesting*". It is worth mentioning that participants' utterances were translated from the original language (German) into English by the first author. Attention was paid to preserving the essence of the original statements.

Results

Reflection on child and welfare assessment

One analytical category that emerged in the data was students' acknowledgement of the complexity in conducting child welfare assessments. Representatively, this participant wrote: "*It is very demanding to work on such a case. One realizes that there is a lot that needs to be remembered and paid attention to. Identifying what is essential for the family is crucial at the same time*" (SA_An_02). Another student stated that "*it was not easy engaging with all levels*

of the problems presented in the vignette and the possible solutions. One needs to think carefully and comprehensively" (st_MA_01).

Also of interest was that students attributed the difficulty encountered during the assessment exercise to a variety of factors, including limited or lack of experience conducting child welfare assessments. This participant (CH_HA_20) for instance wrote: "*As I am not familiar with the procedure in the event of child abuse, I had no way of knowing if they had been addressed*". Another student (GA_MI_22) wrote: "*It was difficult for me to evaluate the information and to come up with a clear problem definition, being worried that I might misinterpret the case vignette*". Being in the final stages of their graduate studies, some students argued that they had taken specialist classes in different areas and not in the field of child protection arguing that it was complicated for them to recall the procedures of child welfare assessment.

Despite the students' acknowledgement that conducting child and welfare assessments is complex, data indicated that a significant sample of the participants understood the importance of sticking to the context of the case vignettes and of utilizing a systems approach to engage with information. One student (SA_AN_08) for instance wrote: "*The first steps (describing the situation and identifying the problems) were much easier for me. You work with the information you get, put forward hypotheses for possible reasons for the situation and behavior, and think about possible consequences.*" Another student (RI_MA_27) explained that "*some things I had answered earlier became clear to me through other questions, which is the reason I kept moving back and forth.*" This suggests that the students understood that assessment is not a linear process calling for constant reviews of decisions made.

Also of interest was that assessing cases in the learning environment seemed to have triggered students' critical engagement in a broader context. BA_KU_22 for example wrote: "*By using this (systems) approach) to conduct assessment, there is a lot of focus on the individual, which may make the impression that they (individuals) are the cause of the problem.*

Of course, changes can be achieved more quickly at the micro level (family system) than at the macro level (society, laws, etc.). Nevertheless, such an individualized view should not give the impression that the person is to blame for the problems". A follow-up on this student's pattern of thinking beyond the assessment exercise would have provided deeper insights on this.

Reflection on features of the GCBL environment

(1) On instructional guidance (scaffolding)

Much as conducting assessment in the GCBL was new to the students, data revealed that instructional guidance was well received, but also critiqued by the participants. Regarding the former, one student (NA_NA_NA) for example wrote: "*The guiding questions helped to keep different aspects of the assessment in mind".* Another participant (MA_FR_20) reported: "*It was helpful to have a well-structured framework for (conducting) assessment.*" Taking into consideration that the first assessment (in the pretest) was conducted without support, the difference that the instructional scaffolds made could be further seen in this student's response: "*In comparison to the first case vignette, I was able to assess this case well and in detail with the help of the questions and the provided suggestions*" (MA_MI_10).

From a different angle however, responses revealed that in some cases, providing detailed instruction interfered with students' problem-solving processes, as (BÄ_BE_04) representatively wrote: "*I wish I had had enough freedom to conduct a comprehensive analysis of the problem definition*". In a similar line, breaking down the assessment process into smaller steps was not by all learners perceived as beneficial at some points and might have oversimplified the assessment task. One student, for instance, stated: "*Some of the guiding questions seemed redundant to me*" (MO_TE_30). Interestingly, at a later stage of the assessment exercise, some students expressed that it had become increasingly difficult to distinguish between the scaffolded steps. In this vein, AN_HE_15 for example wrote: "*It was*

sometimes challenging for me to give different answers for the different steps[...]It became increasingly difficult to concentrate."

Given the complexity of assessing child welfare case vignettes and the mental load associated with working in new learning environments, conducting the entire training in one block might have contributed to the observed. Designing instruction that addresses individual learners' needs while paying attention to what knowledge they bring along is crucial, but observably challenging to achieve.

(2) On the case vignettes

Regarding the presentation of the case vignettes, evidence suggested that having clear and precise information was appreciated. For example, EL_AL_29 wrote: "*The case vignettes were described in detail which made them relatable*". Interestingly, while some students described the provided information as detailed enough, a significant number of them found the uncertainty and missing information therein challenging. These students for instance expressed the need for additional detail or difficulty working with the available information writing: "*It's challenging to work on a case with little information*", (BA_HE_26) and "*It was difficult to suggest a suitable intervention. In 6 months, a lot can happen... I would have liked to know where the family is right now and what their situation is...*" (IN_GU_10).

While the response of the first student representatively alludes to the first phenomenon (provided information being insufficient), the second response is in line with the latter (need for more information). Both patterns were prominently observed across the data.

In a similar manner, it was observed that students tended to have a hard time evaluating the information presented in the case vignettes. As much as working with multiple family members is typical in child welfare assessments, integrating different players seemed to have introduced a certain level of difficulty that was not anticipated, particularly when determining who was to be focused on as a client. In the case of grandfather reporting in concern about a contact to a

missing grandchild and the mum, KA_KL_13 for instance wrote: "*I wasn't sure whether to name the grandfather as the client (since he was seeking help) or Lina as the child at risk.*" Another one (SA_AN_08) wrote: "*It wasn't clear to me whether the client was Mr. Bauer or the young family (Lina, Susanne, Tony). Suggesting a suitable intervention in this case was even more challenging*".

Also, students' responses revealed that presenting the case vignettes as single documents in the GCBL environment made it difficult to suggest interventions without interacting with the clients directly. ZE_RO_08 argued that : "*In a personal conversation, Ms. M.'s situation would have become more understandable. Assessment (in this form) was hypothetical. One needs to have had a conversation with Samara (the daughter) in order to understand her perception of the situation*". For this student, the format in which information was presented was abstract and seemed to have a negative influence on their perception engaging with the case vignettes.

(3)   On the voice-over presentation

Students' feedback on the voice-over presentation integrated into the GCBL appeared to be divided. This had been introduced after the pretest (short assessment without guidance). While some students argued that this feature was helpful to have like DZ_HO_27 writing: "*The task was challenging, but I relied on my gut feeling and the powerpoint presentation as a guide*", others like mo_te_3 argued that "*the presentation [...] was too fast and barely had an impact on my assessments*".

Motivation and interest and their influence on learning in the GCBL environment

Even with the complexity attributed to the task of conducting assessments in the GCBL environment, thematic evidence suggested that students found the exercise to be of value and stimulating. BÄ_BE_04 who had mentioned that time was a limiting factor additionally wrote the following: "*...despite that, it was an interesting experience engaging with the case*

vignettes”. According to MO_BE_8, “*having the opportunity to reflect on the case vignettes and to find solutions from a social worker's perspective was interesting*”. As much as learning in a GCBL environment was a new experience, it can be argued that some students were open to it.

On a different note, students' responses showed that their motivation to conduct assessment in the GCBL environment had changed over time with the given working conditions. CA_AL_15 wrote: “*Initially, I was very motivated and worked diligently on the case vignettes. Nevertheless, my motivation faded with time as the exercise took longer. At some point, it seemed like I was repeating the same replies*”. AN_JO_21 also wrote that “*my motivation to solve the case [had] been negatively affected by the open questions in the case vignette.*

Discussion

As demonstrated by the previous studies, GCBL is promising. Nevertheless, little is known about how social work students actually experience working in such learning environments. We conducted this study with the goal of gaining an understanding of students' reflections about conducting child welfare assessments in a GCBL environment. We wanted to know more about the elements that they perceived as helpful or hindering and those that they generally paid attention to during the assessment process. We conclusively state that:

When it came to assessment of child welfare cases, we observed that students understood the need of taking a systems approach and the role of context. However, dealing with missing and uncertain information seemed to be an element that participants had challenges with. According to Effinger (2021), the ability to embrace uncertainty is a core competence in social work. In the area of child welfare and protection, information is in most cases incomplete and uncertain (Killick & Taylor 2020). When it comes to teaching in GCBL environments, integrating case vignettes with varying severity can be a way of getting students in touch with

scenarios likely to be encountered in practice (Bauer et al., 2022; Fischer et al., 2022), possibly boosting their skills and confidence in the long run.

Also, with the study indicating that students struggled with complexity, missing and uncertain information, it can be argued that providing room for feedback in the GCBL environment would have been beneficial. Feedback in CBL allows for reassessment of one's problem-solving approach (Kolodner et al., 1996). Integrating this element in the GCBL environment could have helped students share, learn from one another's experience and to raise questions. Peer feedback is said to even be more effective when scaffolded (Gielen & De Wever, 2015; Hovardas et al., 2014) and this can easily be implemented in GCBL environments.

When it comes to the features of the GCBL environment, having clear instruction and detailed information was perceived as helpful. The scaffolding questions and hints offered students orientation and pointed them to different aspects that needed to be addressed. However, the concern that detailed guidance may interfere with the problem-solving process as well as students'' autonomy (Dillenbourg, 2002) is something which became evident in our findings. It would be of interest to know if students' perceptions were based on the fact that they already knew enough about the assessment steps, making the support redundant or due to the instruction interfering in their problem-solving which may have had a negative impact on their learning motivation. It could also be the case that this type of instruction introduced cognitive overload memorizing the script during problem solving (Dillenbourg, 2007) rendering the whole exercise strenuous. Clearly, striving for ways of offering optimal guidance has been underlined in the literature (Fischer et al., 2013), but is observably hard to achieve.

It was observed that students overwhelmingly attributed encountered difficulty assessing child welfare cases in the GCBL environment to limited experience and curriculum. With educators being encouraged to support students to gain confidence in their skills for practice

(Fengler & Taylor, 2019), we can reiterate that such social work classes need to integrate practical elements to all classes regardless of the content being taught. In preparing students to work with families and children for instance, practice opportunities do not only have to be limited to specific courses taught in this area. They can be integrated in other classes as well. We perceive child welfare to be crosscutting and that encounters with cases of child abuse can be expected in different fields of social work. Students ought to be supported in their acquisition of knowledge and confidence to act accordingly in cases of perceived harm.

Last but not least, even though working in a GCBL environment was probably new to the participants, it can be argued that it was well received based on the number of participants analyzed for this study.

Limitations

Of course, this study comes with limitations. First, the methods used and the focus on the field of child welfare make it difficult to arrive at conclusions regarding students' perceptions of GCBL in general. It would be of interest to know whether our results can be observed in other areas of social work under the same or at least similar study conditions. Second, even though the case vignettes we used in this study were developed with great care, we do acknowledge critique that case vignettes typically reduce complexity (Gautschi, 2021). Thus, it would be interesting for future research to look at the optimal level of complexity of cases for social work students. Also, further research could investigate the effects of a continuous increase of the complexity of multiple cases. Third, we looked at students' written reflection and did not have opportunities for a follow-up, for example via interviews with the participants. It is not unlikely that the possibility to interact would have helped us to engage deeper with students' perceptions of working in a GCBL environment.

Implications

GCBL is a suitable way of helping students learn about the assessment of child welfare cases (Authors, in press). Features integrated into such environments can help reduce complexity. GCBL environments provide students with a safe space to learn with authentic cases and with it the possibility of putting the knowledge acquired theoretically into practice. Also using a variety of cases can help students gain confidence dealing with the uncertainty of information, which is quite common in child welfare assessments. This study revealed that students were open to learning in GCBL environments, as much as this was probably a new experience. Nonetheless, there are certain elements that need to be paid attention to when creating such learning environments that refer to the clarity of instruction as well as the inclusion of possibilities of interaction and feedback.

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Appendix

Example of case vignette

The social worker A meets with Mr. Bauer, the grandfather of Lina (3 years old). The gentleman appears quite upset and worried, having not seen his daughter and grandchild for 6 months. He reports visiting their home several times. Having met no one, he approached the neighbors, who claimed they had not seen the family for a while.

Additionally, Mr. Bauer shares the following information: Susane (the daughter) had been living with them when she became suddenly pregnant. She was in her final year at college and her partner Tony was not yet done with school either, so the parents offered Susane to stay with them. Tony completed his electrician training shortly before Lina was born. The young family moved out, but the grandparents remained Lina's primary caretakers for the first two years. Subsequently Lina started staying with her parents, but Tony lost his job shortly after. Susane confided in her parents that Tony had started abusing alcohol and acted violently towards her and her daughter. With Susane's visits becoming less and eventually stopping, her parents became worried and sought for talk. The situation escalated and Susane cut off communication. Mr. Bauer is seeking help not knowing how to proceed.

8.   General Discussion

This doctoral thesis investigated (1) how guided case-based learning (GCBL) could be used to support students acquire knowledge crucial to assessing child welfare cases and (2) whether GCBL can be maximized by structuring the learning process. Another aim (3) was to examine how social work students reflect on conducting child welfare assessments in such learning environments. Building on research about structuring learning processes from fields like the learning sciences, Study 1 is an empirical study which compared the effects of different CSS (*adaptable* vs. *strict scripts*) and metacognitive reflection prompts (*generic* vs. *specific)* as well as their combinations on knowledge acquisition. This study also examined whether students' use of the opportunity to adapt their scripts led to better learning outcomes. Study 2 focused on students' perceptions conducting child welfare assessments in such a GCBL environment. With most research on structuring digital CBL environments being outside of the discipline (like Kopp et al., 2008; Vogel et al., 2022; Wang et al., 2017), this thesis contributes to social work by pointing out potentials and limitations of using instructional support in education. Taken together, the findings of this thesis provide implications for social work education and research. However, prior to exploring these, the unique contribution of the of the single studies are presented.

8.1.   *Unique contribution of study 1*

Study 1 contributes to social work literature investigating the effective implementation of digital tools (like Egonsdotter et al., 2020; Spensberger et al., 2022) in teaching. This study was among the first to investigate the use of CSS and metacognitive reflection prompts in the teaching of child welfare assessments. Findings support the idea that offering guidance in CBL environments can help students acquire knowledge more so the conceptual components. Yet the study's findings also reveal that more research is needed to address the element of "optimal scaffolding" (Fischer et al., 2013) in GCBL in social work. Statham and Kearney (2007)

suggest that assessments are effective when they achieve congruence between *what to do, how to do it* and *why.* yet findings show that student's ability to do so might require time. All in all, this study points out the need for further research on scaffolding to facilitate congruent use of all three the afore mentioned components. With its rigorous research design, study 1 contributes to the call for more quantitative research in complex areas like child welfare (Kindler, 2008)

8.2.   *Unique contributions of study 2*

Building on observations made in study 1, this study analysed students' reflection on conducting assessments in a GCBL environment allowing a deeper exploration. For example, the study partially confirmed the hypothesis from Study 1 that "overscripting" (Dillenbourg, 2002) might have occurred underplaying the potential benefits of combining CSS with metacognitive prompts. In addition, students expressed appreciation for the integrated features of the environment, allowing them to focus on important aspects of assessment, which confirmed the potential of the GCBL. A notable contribution of this study is that it identifies key elements that require attention when designing GCBL environments for social work education, possibilities of interaction, avenues of feedback, and clear instruction.

Study 2 additionally revealed that students recognized the complexity of conducting assessments. Consistent with existing research that highlight that uncertainty in child welfare assessments is a challenge (Effinger, 2021; Helm, 2011), students expressed difficulties in evaluating information presented in the vignettes. They attributed perceived hardship to curriculum limitations or a lack of experience dealing with such cases. Considering these findings, it is imperative to explore innovative approaches to support students build confidence in their skills and knowledge (Fengler & Taylor, 2019).

Combined, the two studies in this thesis provide deeper insights about using Computer-supported scripts and metacognitive reflection prompts to teach about assessment in social

work. They reveal potential benefits, limitations as well as student's perceptions working in such learning environments. The next chapter presents potential implications.

9.   Implications

The aim of this doctoral thesis was to examine how GCBL can be used to support social work students acquire knowledge crucial to assessing cases of child welfare and whether the benefits of GCBL could be maximized by structuring the learning process. Another aim was to understand how students reflect on conducting child welfare assessments in such learning environments. Taking the learning outcomes, process evaluation, and a complementary review of these two, following theoretical, methodological, and practical implications for social work can be drawn:

9.1.   *Theoretical Implications*

The first study in this dissertation revealed that students in the guided case-based learning (GCBL) environment acquired higher conceptual knowledge scores compared to those in the unguided case-based learning (UGCBL) environment. This supports the notion that offering structure in GCBL environments makes them effective for learning (Kolodner et al., 1996). This also supports Fischer et al. (2014)'s observation that scaffolding can foster students' engagement in activities of scientific knowledge generation.

Based on the time frame of the intervention and the difficulty of conducting assessments, the effect of GCBL was found to be promising. However, the effects of guided case-based learning on strategic knowledge and reasoning were marginal. Since congruent use of all three knowledge types is vital for an assessment to be considered effective (Statham & Kearney, 2007), this evidence was somehow disappointing. It would be helpful to have research that examines how scaffolds can be designed to support students' proficient use of all three knowledge components. Moreover, long-term interventions might help researchers gain an understanding of whether students can acquire strategic knowledge and reasoning in a guided case-based learning environment over time.

A conflicting body of research exists regarding the best type of metacognitive prompts for facilitating knowledge acquisition. Davis (2003) for example found that, students in the generic prompts setting reflected productively than counterparts in the specific prompts setting. Glogger et al. (2009) demonstrated that specific prompts had better effects on learning compared to non-specific prompts. In study 1 of this thesis, generic prompts proved to be significantly more effective than specific prompts, which was in contrast with what was hypothesized. Most likely, providing students with such prompts increased their ability to engage in other important activities crucial to learning (such as reflecting on the task's goals, learning process, or problem-solving strategies) without interruption. Study 1 therefore supports existing research in favour of generic metacognitive prompts (like Davis, 2003). More research is however needed in social work education to test these assumptions.

Regarding the type of scripts and their effect on knowledge acquisition, whether students learned with was *strict* or *adaptable* did not seem to play a role for the acquisition of knowledge facets. The intensive use of script adaptation options was but related to (conceptual) knowledge acquisition which demonstrated the advantages of "adaptable scripts" (Vogel et al., 2022; Wang et al., 2017).

Much as scaffolding was found to be a unique tool for guiding students' attention during assessment, more research is required to determine how to this can be done in an optimal way. As no interaction effect was observed in this area in study 1, it was assumed that "overscripting" (Dillenbourg, 2002) might have occurred by combining CSS and metacognitive prompts. Furthermore, responses from study 2 provided evidence supporting the idea that breaking down the assessment process into smaller components did not help some students. Based on findings from study 1 and 2, achieving "optimal scaffolding" (Fischer et al., 2013) is a challenge which is not only restricted to the area of GCBL in social work education. Further research in this area is required.

Furthermore, this thesis suggests that students acknowledge the complexity of conducting child welfare assessments, more so when information is uncertain. Client identification was also found to be challenging in assessment situations with multiple actors. As evidence suggests, students find it beneficial to be reminded of key elements of child welfare assessments. Computer-supported scripts and metacognitive reflection prompts can thus be utilized to address these components of child welfare that students have difficulty with. Research in the field of social work would be needed to examine the types of scaffolds most suitable in this regard.

9.2.   Methodological implications

A mixed method approach was used in this doctoral thesis recognising that a single research approach (qualitative or quantitative) would have produced partial understanding on the use of instructional tools to support knowledge acquisition. Utilizing exploratory and confirmatory questions, it was possible to examine the complexity of teaching and learning in a novel learning environment. Having students' reflection for instance contributed to deeper understanding of the quantitative findings in study 1. It was for example possible to confirm that "overscripting" might have occurred following complementary analysis of both studies.

Based on Chaumba (2013), it is argued in the thesis, that mixed methods research provides several advantages, including comprehensive analysis, and increased validity. Nonetheless, it is important to recognize that conducting rigorous research with this approach is time-consuming and requires expertise in both quantitative and qualitative approaches (Buchholtz, 2019; Venkatesh et al., 2013). This thesis, nonetheless, underlines the need for more mixed methods studies in social work education. As a result of the lack of experimental research on the use of instructional designs in social work, it was complicated to predict expected outcomes in study one for example. In designing quantitative studies, social workers must pay careful attention to the research designs, sampling techniques and the selection of statistical models to

ensure reliable and valid findings (Sheppard, 2019). Qualitative studies also need to adhere to quality criteria like the representativeness of data selection and the validity of generalized statements (Flick, 2022). In combining both "strands" validation principles in the respective fields should be adhered to (Venkatesh et al., 2013)

9.3.   *Implications for social work education and practice*

This doctoral thesis supports the idea that conducting child welfare assessment is complicated (Holland, 2010). It is the role of social work education to help students gain confidence in their knowledge, and practical skills (Fengler & Taylor, 2019). Most study participants for instance, attributed perceived difficulty assessing child welfare cases to the curriculum and limited experience in this area. It is crucial to revisit the syllabus in order to address how core competencies such as dealing with uncertainty are taught. While it may not be possible to prepare students for all situations likely to be encountered during in practise, social work educators can use GCBL to foster a systematic problem-solving approach. The approach can also be used to teach different skills crucial to assessment such as critical thinking. In using cases students are provided with the opportunity to connect theory and practise (Egonsdotter & Bengtsson, 2022). Nonetheless classes using GCBL to teach about child welfare need to be integrative, providing both theoretical content as well as opportunities for feedback and interaction with peers. Having clear instruction in digital (CBL) environments is helpful. Building on research that shows that decisions (like whether or not to intervene in case of suspected child abuse) have an impact on the lives of social work clients (Munro, 2008; Taylor, 2013), this thesis emphasizes that building students' confidence in this area would be a benefit to the field. An implication here is that schools of social work have yet to discover effective ways of doing so.

10.   Conclusion

The doctoral thesis had three aims 1) to examine if offering guidance in digital environments could support social work students acquire knowledge crucial to assessing child welfare cases 2) to examine the effects of variants of support on knowledge acquisition and 3) to understand how students reflect about learning in such environments.

The findings revealed that GCBL is a promising way to teach. In study 1, students in the guided case-based learning (GCBL) environment acquired better conceptual knowledge scores compared to their counterparts in the unguided CBL environment (control group). The effects of GCBL on the acquisition of strategic knowledge and reasoning were minimal. Learning with the adaptable CSS was not less than learning with a strict CSS. Frequency in adapting CSS was in fact related to conceptual knowledge acquisition. Generic metacognitive reflection prompts were revealed to have had better effects on knowledge acquisition. Students seemed to acknowledge the complexity of child welfare assessments and identified uncertainty to be one of the challenges. GCBL features were helpful to some in identifying areas to focus during assessments, whereas for others, breaking down assessment exercises was viewed as an interference with problem-solving. Providing optimal support in GCBL to teach about child welfare assessment in social work needs to be further explored. In teaching about child welfare assessment in GCBL environments, scaffolding does not have to be limited to fostering knowledge acquisition alone. It can be used to help students gain confidence in mastering conditions of uncertainty. Nonetheless, caution should be exercised regarding the danger of becoming fixed on "education for certainty" (Taylor & White, 2006) since uncertainty is inherent to social work (Helm, 2010).

Social work scholars are increasingly calling for research into how to teach effectively with digital tools (Coe Regan & Youn, 2008; Racovita-Szilagyi et al., 2018). As Reamer (2019) argues, the use of technology for educational purposes, regardless of whether it is intended to

supplement face-to-face instruction (hybrid format) or to deliver instruction entirely remotely (remote delivery) requires an understanding of the latest standards. To accomplish this, it is imperative to examine current pedagogical theory and research regarding the use of technology in professional education (ibid.). With this thesis, I hope to contribute to research that examines ways of preparing students for the complex field of child protection using digital means.

11.   References

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12.   Academic Integrity Statement

OPIO- MARY GÖRES

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Name, Vorname
Last name, first name

Ich versichere, dass ich die an der Fakultät für Psychologie und Pädagogik der Ludwig-Maximilians-Universität München zur Dissertation eingereichte Arbeit mit dem Titel:
I assert that the thesis I submitted to the Faculty of Psychology and Pedagogy of the Ludwig-Maximilian-Universität-München under the title:

Using guided case-based learning to foster social work students' child welfare assessment skills:
Effects of adaptable Computer Scripts and metacognitive reflection prompts

selbst verfasst, alle Teile eigenständig formuliert und keine fremden Textteile übernommen habe, die nicht als solche gekennzeichnet sind. Kein Abschnitt der Doktorarbeit wurde von einer anderen Person formuliert, und bei der Abfassung wurden keine anderen als die in der Abhandlung aufgeführten Hilfsmittel benutzt.
is written by myself, I have formulated all parts independently and I have not taken any texts components of others without indicating them. No formulation has been made by someone else and I have not used any sources other than indicated in the thesis.

Ich erkläre, dass ich an keiner anderen Stelle einen Antrag auf Zulassung zur Promotion gestellt oder bereits einen Doktortitel auf der Grundlage des vorgelegten Studienabschlusses erworben und mich auch nicht einer Doktorprüfung erfolglos unterzogen habe.
I assert I have not applied anywhere else for a doctoral degree nor have I obtained a doctor title on the basis of my present studies or failed a doctoral examination.

München, 15.05.2023

_____

Ort, Datum
Place, Date

Opio-Göres Mary

_____

Unterschrift Doktorand
Signature of the doctoral candidate