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Effectiveness of approaches to stimulate critical thinking in social work curricula

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Biographical note

An Verburgh holds a Ph.D., in educational sciences of the University of Leuven, Belgium. Since September 2015 she works as an educational developer at University Colleges Leuven Limburg (UCLL), Belgium. Her research focusses on critical thinking and research-based education. Measuring critical thinking development and how learning environments can stimulate this development is the main aim. Recent projects in which she is involved, include a study on the development of a domain-specific critical thinking test and a project on stimulating critical thinking in curricula.

Effectiveness of approaches to stimulate critical thinking in social work curricula

The development of critical thinking is an essential aim in social work curricula, similar to all higher education programmes. Learning environments that effectively stimulate the development of critical thinking are hence of key importance. This paper starts with a small-scale review of the empirical research on learning environments in social work that aim at developing critical thinking in view of gaining insight in the effectiveness of the used approaches. The results indicate that almost all studies had learning environments combining approaches. The review also points at the limited number of empirically sound studies on critical thinking in social work curricula. Therefore, a research agenda is proposed, in order to improve the understanding of critical thinking education within social work and beyond.

Keywords: critical thinking, social work, higher education, review,

Introduction

Social work profession: The importance of critical thinking

Critical thinking has been identified as essential for social workers (Heron 2006; Huff 2000; Lay and Mc Guire 2010; Mathias 2015; Rankine 2017). Social workers are frequently confronted with complex problems, often without clear description and certainly lacking readily apparent solutions (Milner and Wolfer 2014). Social workers need to be able to make reasonable, sound and independent decisions in their clients' benefit. Furthermore they must be able to expound their decisions (Milner and Wolfer 2014; Mumm and Kersting 1997; Rankine 2017). As there is no algorithm to make a decision, decision-making requires critical thinking skills (Milner and Wolfer 2014; Mumm and Kersting 1997). Social workers are expected to be able to critically evaluate the strengths and weaknesses of theories and procedures in order to make decision in a particular case (Mumm and Kerstings 1997). Critical thinking skills help social workers to be more empathetic and less judgemental with others and themselves, as they learn to take the context into account (Huff 2000). Critical thinking is necessary to treat clients as individuals who do not all benefit equally from the same practice models (Mumm and Kerstings 1997).

Defining critical thinking

Despite the acknowledged importance of critical thinking for social workers, there is no commonly shared definition of the concept (Mathias 2015). Paul and Elder (2007, 4) defined it, on a more general level, as “the art of analysing and evaluating thinking with a view to improve it”. Critical thinking is identifying appropriate, relevant and accurate information that results in an informed outcome (Colby 2014). Davies and Barnett (2017) describe three waves of thinking about critical thinking. In the first wave

critical thinking is understood as reflective thinking. Critical thinking requires specific skills in order to make judgements. In the second wave the disposition, the inclination to thinking critically, is included. Here critical thinking does not only require mastery of specific skills but also a frame of mind to invest in critical thought. Examples of such dispositions are empathy, open-mindedness and inquisitiveness. Being a critical thinker is more than having specific skills but requires also the inclination to apply those skills. In the third wave critical thinking is considered as ‘criticality’ (Barnett, 1997). In criticality the identification of and participation in the world of the critical thinking is also taken into account. Criticality implies critical reasoning, critical self-reflection and critical action (Barnett, 2017).

In social work critical thinking is most commonly considered as a form of practical reasoning that guides decision-making in social work practices (Mathias 2015). Within this shared basis, Mathias (2015) unravelled two different conceptual strains within critical thinking in social work. The first strain focuses on the challenge to avoid logical errors in clinical decision-making. In this strain critical thinking aligns with scientific reasoning. Eliminate false assumptions, make biases explicit, distinguish facts and values and ground decisions on research evidence to maximize the likelihood of good decisions. This could be related to the first wave described by Davies and Barnett (2017) focussing on critical thinking skills.

The second strain focuses on the application of social work values in dealing with complex problems (Mathias 2015). In this matter, critical thinking helps to unravel underlying values in social situations. Furthermore critical thinking facilitates to act in line with social work values. This strain aligns with the concept of ‘criticality’ (Barnett 1997, 2017). Although the strains are conceptually different, this comes seldom to the

front and there is little discussion about how critical thinking should be conceptualised within social work (Mathias 2015).

A recurrent debate in the literature on critical thinking concerns the domain-general and domain-specificity of critical thinking (Dwyer 2017). In the former critical thinking is considered as a set of more generic skills that can be applied in different contexts (Ennis 1989). In the latter critical thinking is specific for the field or discipline of the topic at hand (Middendorf and Shopkow 2018). Currently, some consensus seems to exist that there are generic critical thinking skills, applicable in various contexts, while familiarity with the discipline plays an important role too (Angeli and Valanides 2009). As critical thinking implies assessing the value of claims and considering alternatives, it requires knowledge of the discipline, including rules, procedures and strategies considered appropriate in the discipline and also knowledge of possible alternatives or being able to develop them (Stanovich, West and Toplak 2016).

Critical thinking needs to be developed during social work education

Given the importance of critical thinking, social work educators are challenged to develop pedagogical strategies which enable students to develop critical thinking (Gibbons and Gray 2004; Lay and Mc Guire 2010; Milner and Wolfer 2014). A major challenge is to educate students who profoundly understand the theories studied and are capable to apply them reflectively (Gregory and Holloway 2005; Mumm and Kerstings 1997).

The importance of critical thinking development during education is common with other disciplines (Friedman et al. 2010). According to Bok (2006) it is considered as a principle aim of undergraduate education.

The actual development of critical thinking in social work education is however not self-evident (Heron 2006; Tetloff et al. 2014). The study of Arum and Roksa's (2011) on critical thinking development, showed an overall low growth during college. Social work students were among the students with the lowest gains. Nevertheless development at programme level in social work is possible (Heron 2006; Simmons 2014). Simmons (2014) found a modest positive influence of education in social work on cognitive complexity, an essential aspect of critical thinking. His results suggest that education has more influence than practice experience or age.

Review study

Research aim and frame of four approaches

The development of critical thinking is not a natural process but a process that requires dedicated attention in education (Abrami et al. 2015; Huff 2000). As critical thinking depends on a discipline, teaching critical thinking requires thorough disciplinary knowledge and embedment in a discipline (Middendorf and Shopkow 2018).

In social work literature, relatively little has been written about strategies to stimulate critical thinking (Mathias 2015; Milner and Wolfer 2014). Within social work two review studies on critical thinking interventions are known. Samson (2016) explored whether social work students are trained to think critically and what teaching approaches were most effective. In the ten included quantitative studies, she retrieved a wide variety of different teaching approaches with "relatively humble findings and little statistical significance" (Samson 2016, 154). The second review study (Mathias 2015) found a wealth of teaching approaches within the included 34 studies. 21 of those studies tried to measure the effect of the used teaching approach. Both studies

concluded that teaching approaches are relevant in the development of critical thinking but that it was not possible to draw conclusions about effective teaching approaches.

This review study aims at gaining insight in effective learning environments in social work education. In order to organise the diversity in teaching approaches encountered in previous review studies, teaching approaches could be classified according to the four categories identified by Abrami and his colleagues (2015). The learning environment is the educational setting where one or more teaching approaches are used.

Four approaches relevant for the development of critical thinking

In their meta-analysis Abrami et al. (2015) identified four categories of teaching approaches relevant for the development of critical thinking (see figure 1). Each category involves various teaching approaches.

- *Insert figure 1 around here* -

The first category is *dialogue*. Within this category learning takes place through discussion. Students can discuss a certain problem within dyads, in small groups or with an entire class. This category is not limited to oral discussions, it can also involve written discussions, such as online discussion fora. Abrami et al. (2015) observed elevated effects whilst teachers pose questions and in teacher-led class and group discussions. Walker (2003) reached similar conclusions about posing questions. This category also includes collaborative learning. In collaborative learning students work together towards a common goal (Gokhale 1995). Tsui (2002) attributes this development to the fact that by participating in group discussions students are forced to

verbalise their thoughts. Moreover they are not only triggered to think about their own point of view, but also about that of others.

Authentic instruction is the second category of Abrami et al. (2015). In authentic instruction students are confronted with realistic problems that are appealing to them. Simulation, role play, case studies and dilemma exercises are examples of authentic instructional approaches. This category attributes to the development of critical thinking as well (Abrami et al. 2015). Role play with real live stories, case studies and discussions are methods that stimulate metacognitive skills, skills in relation to thinking about the own way of thinking (Staib 2003). Since these metacognitive skills guide thinking processes, they are important for critical thinking (Halpern 1998).

Abrami et al. (2015) identify *mentoring* as the third category. Mentoring includes one-to-one interaction between teacher and student, coaching and modeling. Modeling is, according to Beyer (2008), one of the techniques teachers can use to introduce a new thinking skill: functioning as a model to monitor and express the use of the skill. Being an expert in a discipline is for modeling of major importance although it is not sufficient. It is also important that the expert is conscious of the required thinking processes within the discipline and the often tacit steps experts take when tackling a disciplinary problem (Stanovich, West, and Toplak 2016). In modeling this tacit knowledge is made explicit. In supplementary practice scaffolding and cueing techniques can be used (Beyer 2008; Pithers and Soden 2000). In scaffolding support is given to students by means of diagrams, schemes, written questions, a checklist, ... These tools function as a scaffold for students to the point they are sufficiently skilled and no longer need it. In cueing little hints are given. These small indications force

students to think about the next step, without explicitly revealing the next step (Beyer 2008). Cues help students to recall what they have already learned (Halpern 1998).

The positive effects of mentoring on critical thinking appear to be higher when combined with one or two of the other categories. As such, combining approaches of the three categories in the learning environment results in the highest impact on critical thinking (Abrami et al. 2015).

The fourth category is *individual study*. This category includes all teaching techniques that involve individual work of students such as reading, listening to the teachers, making sense of new information, individual problem solving or individual writing. Abrami et al. (2015) did not include this category in their analysis. In their sample this category was equally present in the experimental conditions as in the control conditions. Therefore they could not identify its effects. Nevertheless there are indications that individual study in combination with a teaching approach from another category is beneficial for critical thinking. Tsui (2002) found a positive effect of writing and rewriting. In rewriting students are triggered to think deeper about their own writing, especially when they receive feedback from their peers or teacher. This two-step process with feedback has more effect compared to conditions without feedback (Tsui 2002). Similar results are found by Anderson and his colleagues (2001): if students discuss their writing in group, they are more capable to profoundly justify their point of view in their writing assignment compared to students lacking that discussion.

The research question of this review study is: How effective are different teaching approaches in social work curricula to stimulate critical thinking? Analysing

the teaching approaches used in a learning environment will help to gain insight in ways to stimulate critical thinking development.

Methodology

To correctly address the research question a systematic review was performed. Inspired by Petticrew and Roberts (2007) this review study was conducted in three main phases (see figure 2). During the first phase, the initial search, a search was done in Web of Science. The search strategy was conducted with combinations of three keywords: “critical thinking”, “higher education” and “social work”. Web of Science was selected as it contains important journals in the field of social work education. Only peer reviewed journal articles, written in English, were included. No limitations concerning the publication date were used. This resulted in an initial set of 98 articles.

-insert figure 2 around here-

Next, relevant articles to answer the research question were selected in two subsequent phases. In phase 2, the basic screening, titles and abstracts were read. Articles without an intervention study on critical thinking in social work education were excluded. This resulted in an exclusion of 55 articles.

In the third phase, the in-depth analysis, the 43 potentially relevant articles were studied systematically. The selected inclusion criteria were: 1. a description of the learning environment and the used approaches, 2. a qualitative or quantitative investigation on the effect of the intervention on critical thinking, 3. with social work students, 4. within a module (and not a whole degree programme). In contrast to Petticrew and Roberts (2007) the methodological quality of the studies was not used as an inclusion criterion. This decision was made to avoid missing possible valuable learning environments. If an

article concerned a particular learning environment within a social work programme, a synthesis sheet was made. If an article was about the whole programme, no synthesis sheet was made. The synthesis sheet included the research question(s) addressed, the teaching approaches used, the research design, number of participants, the way critical thinking development was assessed, the use of a definition on critical thinking, duration of the intervention, the presence of a control group and the results of the study. Based on this analysis six articles were found relevant to answer our research question and were hence included.

Results

A comparative analysis of the included studies was conducted (see Table 1). In the description of the study, the used approaches are identified between brackets.

- *Insert Table 1 around here* -

In the study of Bolea (2012) social work students were involved in a service learning experience in a tribe of Native Americans. The course aimed to stimulate the reflection on the role of social workers while working with Native Americans. Enrolled students participated in a 10-day immersion experience in a tribe, working together with tribal personnel. Under the supervision of a tribal employee, students participated in activities of the tribal agencies such as schools, behavioural health clinics or social service programs (authentic instruction). Prior to departure students were prepared in two orientation sessions. Upon return there was a group session for debriefing and a written assignment (individual study). From the description the precise approaches used in the orientation sessions and the debriefing were not clear. Therefore it is not clear if dialogue or mentoring took place.

The impact of the course is measured by a voluntary survey on personal values and educational growth. Students were asked to reflect upon their experiences, related

to critical thinking (judgement and decision making). The results of four cohorts of students were analysed qualitatively by three researchers. Students reported that in the past they often judged without knowing. The immersion experience made them more conscious about this. They stated that the service learning experience made them more inclined to informed decision making, as an element of critical thinking.

In a pre-test-post-test design study, Huff (2000) compared the effect of live instruction versus interactive television on the development of critical thinking skills. Distance education students and on campus students received similar instruction, with the exception that the face-to-face instruction of the on campus students was broadcasted with interactive television to the distance education students. All students had to arrange journaling with peers, conduct online discussions, group presentations and identify fallacies in real examples (dialogue teacher-led, individual study). The teacher designed specific techniques to elicit critical thought (mentoring with scaffolds). On the exam students had to describe different sides of controversial issues. They were encouraged to question what they heard or read in the media and from their instructor.

The test used to measure the effect of the intervention was the CCTST developed by Facione and Facione (1994). The CCTST is a 34-items test on critical thinking skills with five subscales (analysis, evaluation, inference, deductive reasoning and inductive reasoning). The results showed that students improved their critical thinking skills, with no difference between the distance and on-campus students.

Jones (2005) investigated the effectiveness of the case method, which aimed to support graduate students enrolled in a clinical concentration, to more completely incorporate the meso and macro dimensions in clinical situations of social workers.

Critical thinking was considered as one of the aspects to incorporate meso and macro dimensions in decision making. Each case included a central client to whom students could identify to. Furthermore students received information on factors impacting the client on micro, meso and macro level (authentic instruction). The learning environment involved five three-hour class sessions. In each session one case was discussed, following a similar approach: (1) students read the case and identified the relevant impact levels by means of discussion (dialogue teacher-led), (2) designed potential solutions and (3) evaluated possible outcomes of these solutions. Students received a list of meso and macro practice skills definitions (mentoring with scaffolds). Students had to write a paper about the case, identifying the various factors impacting the client's situation at different levels (individual study).

A self-report questionnaire was used to measure the students' perceived ability to apply critical thinking skills. The results showed a significant growth in the perceived capacity for critical thinking.

In a small scale study (N=5) Lit and Shek (2007) investigated the impact of a specific approach in field work supervision of social work students during a ten weeks period (authentic instruction). In supervision sessions several elements of critical thinking were introduced to students. They were stimulated to be sceptical towards attitudes and knowledge and to co-construct the narrative of the situation with their clients. Moreover they were challenged to critique the larger system and create awareness of the importance of reflexivity. They were compelled to be aware of value and relativity and were asked to stress their own as well as their clients' strengths. Furthermore students were enquired to be tolerant to 'not knowing' or being uncertain.

The supervision consisted of two 90 minutes individual supervision sessions per week and five group supervision sessions, where the participants interacted with one-another (dialogue teacher-led). In the sessions the supervisor used different modeling techniques, such as asking students point of view, deconstructing questions to facilitate reflection on relationships and contextual influences (mentoring by modeling). In addition students had to compose weekly diaries and a pre- and post-fieldwork placement journal (individual study). At the end of the field placement the supervisor conducted an in-depth interview with each student.

This qualitative analysis displayed a growth on the different objectives of the course, for example students developed a critical view and were more tolerant towards uncertainty.

Mumm and Kersting (1997) describe in their article different methods to teach critical thinking to graduate and undergraduate social work students and assess the effect on graduate students. Their starting point was that students (too) often fail to explain the rationale of their assessment and interventions in practice decisions. Therefore they proposed a dedicated learning environment for the development of critical thinking skills. In the first class students wrote individually about their last clinical practice, namely what theories they used and why they used them (authentic instruction), followed by a discussion in small groups (dialogue teacher-led) and a lecture about theories and values in social work profession. Students received guidelines for theory evaluation (mentoring by scaffolding) and were stimulated to adapt these guidelines to their own beneficial questions. Next, students were given reading assignments on prescriptive and descriptive social work theories (individual study).

Each unit started with a lecture about the theory and its assumptions, followed by a discussion and demonstration of the practical applications (e.g. by role playing, analysis of video-material, discussion about own experiences in the field work). The units concluded with a critical analysis of the unit. During the semester each student had to present a theory and they were challenged to illustrate the theory using their own clinical practice (individual study, authentic instruction). The semester concluded with a repetition of the exercise of the first class about the use and argumentation of theories in the clinical practice.

A qualitative comparison between the results on the exercise at the beginning and the end of the semester showed the development of critical thinking. In the final exercise students could better articulate their rationale for using a specific theory and their practice dilemmas and limitations.

Vandsburger and her colleagues (2010) investigated the effect of a simulation game about poverty on students' critical thinking about poverty. Students of different majors were involved (health sciences, social work, nursing, physician assistance and occupational therapy). The simulation started with background information and explanation of the simulation. During the simulation of two hours, students were divided into different 'families'. Each family had to provide basic needs and shelter for one month. Each 'month' consisted of four 15-minutes 'weeks'. In a large room, families could visit different 'services and community resources' played by volunteers (authentic instruction). The simulation concluded with a discussion lead by a facilitator on the experiences of the students (dialogue teacher-led).

The effect was studied with a pre-test one month before and a post-test immediately after the simulation. The self-developed test concerned critical thinking about poverty. No development on critical thinking about poverty was found, although there was an increased understanding of what living in poverty implies. Students majoring in social work did not differ from students in other majors.

Discussion

Tentative suggestions about stimulating critical thinking in social work

This review study aimed at illuminating the effectiveness of different teaching approaches in social work curricula to stimulate critical thinking. Each of the included six studies combined at least 2 approaches identified by Abrami et al. (2015): dialogue, authentic instruction, mentoring and individual study. Five studies showed progression in critical thinking. The intervention without development was an intervention of two hours, whereas the other studies were spread over a longer period. This contrasts with the findings of Abrami et al. (2015) who found that short term interventions can be similarly effective. The result of this review study is more in line with the contention that critical thinking development takes time (Arum and Roska 2011; Pascarella et al. 2011). Hence this review points to the positive value of interventions spread of a longer period of time, with a combination of at least two approaches of Abrami et al. (2015) for the development of critical thinking in the field of social work education.

The concept of critical thinking

In two articles critical thinking is defined, in relation to social work and in general, namely in Huff (2000) and Mumm and Kerstings (1997). In their description they use partly similar authors such as Gibbs and Gambrill, for social work, and Paul, for critical

thinking in general and partly different authors or authorities, such as Knight or Kurfiss (Mumm and Kerstings) or the Council on social work education (Huff). Both articles confine themselves to critical thinking skills. Lit and Shek (2007) used the concept of critical thinking power. The complexity of critical thinking or the precise impact or value for the social work profession is generally neglected. The importance of being a critical thinker or the value of criticality in social work is not discussed in the included articles, similar to the findings of Mathias (2015). This limited attention to what is explicitly aimed at concerning critical thinking or the underlying conceptual strains (cfr Mathias 2015) is problematic as the effectiveness of a carefully designed learning environment builds on very precise aims (Seel et al. 2017).

Limitations

A major limitation of this review study is that only six studies were retrieved, studies often with basic research designs. Therefore the conclusion of the value of combining different approaches is to be taken with caution. The data retrieved are insufficient to generate inferences about the specific value of a particular approach. Neither does this review study allow to differentiate the suitability of specific approaches to specific aspects of critical thinking.

The methodological quality of the included studies varies extensively and is generally spoken low. In none of the studies there is a genuine control group that did not receive the intervention. Only in one study (Huff 2000) there was a real comparison between two groups but both groups received training to stimulate critical thinking. In only two studies critical thinking is clearly defined. The number of participants is unclear in two studies. Only one study used a validated instrument (Huff 2000) although it is generally acknowledged that the assessment of critical thinking and its development

is a difficult endeavour (Ku 2009). The use of self-developed instruments and often the lack of a clear definition of critical thinking, suggests that the authors are often unaware of the complexity of the concept of critical thinking and its assessment. The description on the qualitative analysis in Lit and Shek (2007) is elaborated, in the other studies it is concise.

Promising learning environments that call for further research

Despite the limitations of this review, the selection process of the articles for this review study indicates that critical thinking is a topical issue in social work curricula. In the second phase of the selection of articles, the 43 articles selected in the first phase were read (see figure 2). In those articles, many descriptions of promising learning environments were found. Authors of these articles claim the importance of critical thinking and the need to develop it better as they are often not satisfied with the level of critical thinking of students and/or of graduates. They designed learning environments with the intention to stimulate students to become better critical thinkers. Because they did not evaluate the impact of their interventions on critical thinking, they could not be included in the review.

One of the examples is the learning environment used by Alter and Egon (1997). Students were stimulated to break down the helping process within social work into parts and build logic models (authentic instruction, dialogue teacher-led, individual study, mentoring with scaffolds). These logic models were intended to stipulate different associations, such as connections between theory and practice, interventions and outcomes at individual, organizational, community and societal level. With a fictive but possibly real situation Milner and Wolfer (2014) used decision cases to foster critical thinking (authentic instruction). In a decision case, students were presented a problem they had to solve. Students had to prepare each decision case before meeting in

group (individual study), by identifying the influencing factors. With thought provoking questions the teachers stimulated students to go beyond the obvious and dig deeper in the problem (mentoring and dialogue teacher-led). Because in none of these articles empirical research was conducted, they could not be included in the review study, but they clearly point to a richness in learning environments.

Towards a research agenda for the broader field of critical thinking development

The results of the small scale review touch a crucial aspect in critical thinking education and research on it, namely the domain-specificity of critical thinking education. The tentative suggestion that within social work a combination of at least two approaches is needed during a longer period of time is in line with research that does not focus on one particular discipline (Abrami et al. 2015, Pascarella et al.2011). This raises the question of whether the fact that critical thinking is enacted within a discipline, also implies that powerful teaching for critical thinking is domain-specific. Stated differently: it is unclear whether the elements that make a learning environment effective for critical thinking development differ fundamentally over disciplines. It might be that effective learning environments for critical thinking within one discipline are merely instantiations of more generally applicable principles. In that case, effective approaches for critical thinking would be embedded within a discipline without necessarily being solely applicable within that discipline.

A research agenda for future research on critical thinking education is proposed. Research with four characteristics is desired. First, research on critical thinking education builds on findings of instructional design research and is carefully designed

as proposed by Tiruneh et al. (2016). Second, in such research, discipline or profession is at the same time important and irrelevant. Discipline is important because it influences the understanding of critical thinking and it requires an extended knowledge of the discipline with its underlying principles, assumptions and procedures. Discipline is at the same time irrelevant because it is merely a means to unravel a more generally applicable principle. Third, future research on critical thinking departs from clearly defined aims in relation to critical thinking, for example aims in relation to the demands for critical thinking within social work (See Seel et al. 2017). Fourth, the research design is strong (see also Samson 2016). The review points to the need of more high quality research with sound research designs, using clear descriptions of critical thinking, with inclusion of genuine control groups and using validated instruments, preferable tests that go beyond self-reports. None of the studies included in the review met all these criteria. Research could for example focus on what effective modeling entails in clinical decision making in the social work profession or on how dialogues can be structured to unravel underlying values in social situations.

Such research could not only illuminate the validity of the conclusions of this review study and make more grounded suggestions for future practice, in social work education and beyond. It would add to the overall understanding on how to stimulate critical thinking, as it would raise the insight on under which conditions modeling stimulates learning of decision making or how dialogues contribute to learning about bringing underlying values to the front. These aimed at elements of critical thinking are not only relevant for social work but also in other disciplines.

Conclusion

This paper points to indications that the development of critical thinking in social work programmes is supported by learning environments that combine at least two of the teaching approaches (dialogue, authentic instruction, mentoring and individual study) during a longer period of time (such as a semester). However more empirical research is needed to underpin these indications. Studies with conceptual clarity on the kind of critical thinking aimed at, learning environments that are designed towards the intended aims, with a sound research design and that use validated research instruments will help to improve the critical thinking education, in social work and beyond.

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Table 1. Comparative analysis of the studies under review

Study	Teaching approach				N	Program level	Description of critical thinking	Duration of the intervention	Design	Control group	Measure	Effect
	Dialogue	Authentic instruction	Mentoring	Individual study								
Bolea, 2012	n.i.*	yes	n.i.	yes	about 48 (4 cohorts)	BSW and MSW	No	about one month (with 10 days of immersion)	Intervention followed by voluntary course evaluation	no	Qualitative: Survey with open-end questions	Positive effect
Huff, 2000	yes, teacher-led	n.i.	yes	yes	62	MSW	Yes, in general & related to social work, critical thinking skills	one semester	Comparison between two groups, with pre- and post-test	no	Quantitative: CCTST	+++
Jones, 2005	yes, teacher-led	yes	n.i.	yes	115 (2 cohorts)	MSW	No	Five three-hour class sessions, spread over a semester	Intervention with a pre-test – post-test	no (but with an attempt)	Quantitative: Survey with one self-report question about ability to apply critical thinking skills	+
Lit and Shek, 2007	yes teacher-led	yes	yes	yes	5	MSW	Description of critical thinking power	10 weeks	Intervention with data collection during and after the intervention	no	Qualitative: analysis of indications for (among others) critical thinking in students reflections, diaries, supervision transcripts and in-depth interviews	Positive effect
Mumm and Kersting, 1997	yes, teacher-led	yes	yes	yes	n.i.	MSW	Yes, in general & related to social work critical	one semester	Intervention with a pre- and post-test	no	Qualitative: analysis of the responses of students on the same exercise at the	Positive effect

Vandsb urger et al., 2010	yes, teacher -led	yes	n.i.	no	101	Under- graduate, 5 different majors	thinking skills No	2 hour session	Intervention with a pre- and post-test	no	beginning and at the end of the course. Quantitative: teacher designed questionnaire with a critical thinking scale, with 12 questions on a Likert- type scale.	0
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*n.i= not identifiable, ** += positive effect for quantitative studies, 0=no effect for quantitative studies

Figure 1

Approaches to stimulate critical thinking, based on Abrami et al. (2015)

Dialogue	<ul style="list-style-type: none">• learning through conversation and discussion• teacher-led/student-led, online/face to face, collaborative learning, dyad/trio/group
Authentic instruction	<ul style="list-style-type: none">• learning through realistic situations• role play, case studies, dilemma exercises
Mentoring	<ul style="list-style-type: none">• learning with one-to-one interactions between teacher and student, modeling, coaching (with scaffolding and cueing)• one-to-one interaction between student and teacher, coaching, modeling, scaffolding, cueing
Individual study	<ul style="list-style-type: none">• learning through individual processing of material• reading, listening, writing

Figure 2

Flowchart of the selection process

