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Critical thinking as a citizenship competence: teaching strategies

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Abstract

This article is about enhancing critical thinking as a crucial aspect of the competence citizens need to participate in society. First empirical research into the question which instructional strategies are 'effective' in enhancing critical thinking is reviewed. Characteristics of instruction that are assumed to enhance critical thinking are: paying attention to the development of the epistemological beliefs of students; promoting active learning; a problem-based curriculum; stimulating interaction between students; and learning on the basis of real-life situations. Research has failed to prove the effectiveness of programs especially devised to improve critical thinking (higher-order) skills. In the second part of this article, the various proposals for instructional formats for critical thinking are discussed from a social constructivist point of view. Learning to think critically is conceptualized as the acquisition of the competence to participate critically in the communities and social practices of which a person is a member. If education is to further the critical competence of students, it must provide them with the opportunity at the level of the classroom and the school to observe, imitate and practice critical agency and to reflect upon it. Learning contexts must be chosen which students can make sense of and in which they can develop a feeling of responsibility for the quality of the practice in question.
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1. Introduction

It seems evident that schools must prepare students for participation in society as citizens in the broadest sense. Citizenship in modern society, however, demands other competences than previously. Nowadays people are not expected to 'know

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their place' but to 'determine their own position'. A 'critical' approach is frequently appreciated more than subservient accommodation. It is a question of making choices and knowing why you are making that choice, respecting the choices and opinions of others, communicating about these, thereby forming your own opinion, and making it known. Of course, the extent to which a 'critical' approach is valued and by whom differs. But nevertheless 'to be critical' seems to be part of our western culture.

The aim of educating for critical, democratic citizenship has recently been elaborated under the heading of 'critical thinking'. In the 1980s there was an outburst of interest in critical thinking. In various research and policy reports in the USA it was stated that a higher-order thinking ability was lacking among students and that democratic society required students to think critically (e.g. Glaser, 1985; National Education Goals Panel, 1992). The widespread focus on critical thinking as an educational goal does not alter the fact that critical thinking is a complex and contested construct, varying from a politically oriented educational aim (e.g. Giroux, 1992; McLaren, 1995) to a higher-order thinking skill (e.g. Halpern, 1998).

In this article, we focus on the question of instructional strategies for enhancing critical thinking. The central tenet is that critical thinking is a crucial aspect in the competence citizens need to participate in a plural and democratic society, and that enable them to make their own contribution to that society (see also Miedema & Wardekker, 1999; Ten Dam & Volman, 2003). Instructional strategies for critical thinking should be aimed at this. As we will see, however, the literature on the teaching and learning of critical thinking primarily focuses on critical thinking as a higher-order cognitive skill rather than on critical thinking as a competence for critical participation in modern society. Therefore, this article consists of two parts.

In the first part of this article we review (empirical) studies on fostering critical thinking into the following questions: *Which definitions of critical thinking are used in the literature? Which instructional designs are proposed for enhancing critical thinking? What is known about the 'effectiveness'*[1] *of particular instructional strategies?* We will first give a brief description of the search we carried out. Then we present the results of our literature search. After paying attention to the various definitions of critical thinking and the main disputes, we give an overview of the instructional formats for critical thinking that are being proposed, including the issue of assessment. In the second part of this article, we look again at the various and often fragmented proposals for instructional formats for critical thinking from the perspective of '(critical) democratic citizenship education'. We pose the following question: *How can critical thinking be conceptualized from this perspective on citizenship education and what are the consequences for developing instructional designs?* We conclude this article by summarizing the main results and pointing out directions future research should take.

[1] By the word 'effective' we mean: what kind of instructional designs seem to work, for whom, and in what conditions?

2. Method

In the literature search, conducted in 2000, we identified studies on instructional formats for enhancing critical thinking in education. Computerized reference databases (ERIC and SSCI) were searched for potentially relevant studies published after 1990. We used the following keywords (incl. synonyms and related terms): *critical thinking* in relation to *(secondary) education, instruction, teaching, intervention, and learning*.

We limited ourselves to reports that were published in peer-reviewed/referreed journals, papers presented at international conferences using peer review procedures, or as contributions to books. The abstracts of the articles/papers were checked to ascertain whether they could potentially shed light on our research question.

In addition to the search, the reference sections of recent articles/papers were examined for relevant material ('snowball method'), published before and after 1990. Finally, we asked several researchers to provide recent papers pertaining to our research question and we looked for potentially relevant contributions to important educational conferences held in the last 4 years (AERA and EARLI). The final outcome was a total of 55 studies with which we conducted our review.

Considering our method of selection, we consider this set of publications a representative sample of the studies published under the heading of critical thinking in the international literature. This means that searches by other researchers, using the same criteria, would result in more or less the same set of publications.

The analysis of the studies found follows from the aim of this article, framing the concept of critical thinking in the perspective of citizenship education. In the analysis, we firstly distinghuished between publications focusing on defining or conceptualizing critical thinking and publications on the question how to enhance critical thinking in education. A large part of the literature found appeared to be theoretical (not empirical) in character, and moreover theoretically and methodologically diverse. A quantitative meta-analysis was therefore not possible. It was decided to analyze the studies, the empirical studies included, in a mainly narrative way. In the analysis of the empirical studies we restrict ourselves to an indication of the designs used and the (statistically significant or qualitative) results. In the second part of the article we reinterpret the results of the review from the perspective of '(critical) democratic citizenship education' (Section 5).

3. Critical thinking: definitions and discussions

Since the 1980s many people allege that critical thinking contributes to the development of rational deliberation relevant to a democratic society (Lipman, 1991; Weinstein, 1991). From a *philosophical* point of view, critical thinking is primarily approached as the norm of good thinking, the rational aspect of human thought, and as the intellectual virtues needed to approach the world in a reasonable, fair-minded way (Gibson, 1995). *Psychologists* conceptualize critical thinking first and

foremost as higher-order thinking skills and focus attention on the appropriate learning and instruction processes (e.g. Halpern, 1998; Kuhn, 1999). Lastly, the concept of critical thinking functions in '*critical pedagogy*'. Critical thinking refers here to the capacity to recognize and overcome social injustice (see e.g. McLaren, 1994). Although we share the critical pedagogical point of view, especially the emphasis on critical and democratic citizenship as an educational goal and the focus on transforming society (Ten Dam & Volman, 1999), in our review of the research literature we primarily focus on psychology-oriented research. Obviously the reason for this lies in our concern with the development of adequate instructional designs for enhancing critical thinking.

One of the most well-known definitions of critical thinking originates from Ennis (1991, pp. 1–2). He defines critical thinking as 'reasonable reflective thinking that is focused on deciding what to believe or do'. Critical thinking includes such acts as 'formulating hypotheses, alternative ways of viewing a problem, questions, possible solutions, and plans for investigating something'. In his definition, Ennis distinguishes between *skills* (analyzing arguments, judging credibility of sources, identifying the focus of the issue, and answering and asking clarifying and/or challenging questions) and attitudes, the so-called *dispositions* (be prepared to determine and maintain focus on the conclusion or question, willing to take the whole situation into account, prepared to seek and offer reasons, amenable to being well informed, willing to look for alternatives, and withholding judgement when evidence and reasons are insufficient) (Ennis, 1987, 1991; Kennedy, Fisher, & Ennis, 1991). Also for Paul (1992) the dispositions are an essential part of critical thinking: without being open-minded and considerate of other people and perspectives, critical thinking does not exceed 'egocentric and sociocentric thinking' (critical thinking in the 'weak sense' according to Paul).

Although most authors agree that critical thinking involves both skills and dispositions, in empirical, often psychological, research attention is primarily paid to the thinking *skills*. For example, Pascarella and Terenzini (1991, p. 118) note that critical thinking has been defined and measured in a number of ways 'but typically involves the individual's ability to do some or all of the following: identify central issues and assumptions in an argument, recognize important relationships, make correct inferences from data, deduce conclusions from information or data provided, interpret whether conclusions are warranted on the basis of the data given, and evaluate evidence or authority' (see also Furedy & Furedy, 1985).

In order to characterize critical thinking, several authors go back to Bloom's work (1956) (see e.g. Kennedy et al., 1991; Halpern, 1998). He included thinking skills related to critical thinking in his taxonomy of educational objectives (Beyer, 1987 in Garside, 1996). In contrast to lower-order thinking skills with a focus on knowledge, comprehension and/or application, critical thinking is often equated with analysis, synthesis and/or evaluation, the higher-order thinking skills. Halpern (1998), for example, comes to the following taxonomy of critical-thinking skills: verbal-reasoning skills; argument-analysis skills; thinking skills such as hypothesis testing; thinking in terms of likelihood and uncertainty; decision-making and problem-solving skills.

A problem that is connected with the characterization of critical thinking as a higher-order thinking skill is the unclear distinction between critical thinking on the one hand, and other kinds of higher-order thinking on the other. This holds true, in particular, for problem-solving and creative thinking (Kennedy et al., 1991). Hartman and Sternberg (1993), for example, draw the line as follows: critical thinking is an application of the cognitive system people use to *select* between environments, whereas creative thinking is used to *shape* the environment. Others reserve the term 'critical' for a specific quality of higher-order cognitive skills or strategies (e.g. Garside, 1996; Marzano et al., 1988): as we solve a problem, we can do it more or less critically.

Several authors emphasize the reflective, self-evaluative nature of critical thinking, and point out that the metacognitive skills needed for this should be adressed in instruction (e.g. Halpern, 1998). Paul (1992) even calls critical thinking spurious when students are not being taught standards and criteria for assessing their own thinking. For Kuhn (1999) both metacognitive skills, metacognitive knowledge and epistemological beliefs are crucial for critical thinking. The latter is considered to be the most important part because it influences the other components.

To close this part of the review about the question 'what is critical thinking' we would like to point out three debates that are relevant to the aim of this article. The most well-known dispute concentrates on whether critical thinking must be understood as a set of general cognitive skills and dispositions (e.g. Ennis, 1989; Paul, 1992; Siegel, 1992) or as skills and dispositions that vary in character across different domains (e.g. McPeck, 1981, 1990). Recent literature, however, moves away from the dichotomy of general versus specific skills. Most authors point out that—although knowledge and skills are interdependent, and that an individual's familiarity with the subject matter plays an important role—some general principles of critical thinking exist that transcend specific subjects and are more widely applicable than to just one single subject (e.g. Facione, 1990; Gibson, 1995; Kennedy et al., 1991; Tsui, 1999). We follow this line of thought in this article. This does not mean, however, that such skills can be learnt in isolation from the subject matter (see further in Section 4).

The second dispute which is of consequence to our research question concerns the 'rationalistic' foundations of the epistemology of critical thinking. It is argued that by focusing on logical thinking, critical thinking excludes other sources of evidence or forms of verification (experience, emotion, feeling). (see Burbules & Berk, 1999, p. 57.) Moreover, the conceptualization of critical thinking as primarily a cognitive style neglects the importance of care and commitment to a particular subject (Kaplan, 1991; Thayer-Bacon, 1993). A rationalistic foundation of critical thinking seems to be in conflict with 'women's ways of knowing' (cf. Belenky, Clinchy, Goldberger, & Tarule, 1986; Severiens & ten Dam, 1998), and may be class and cultural biased (Atkinson, 1997). Empirical research into this 'cultural bias', however, is lacking. Related to the focus on valid arguments, supporting evidence and conceptual clarity, critical thinking is also accused of stimulating relativism (Veugelers, 2000). This is primarily due to the overwhelming attention paid to the skills

necessary for rational and logical reasoning and the neglect of the subject matter which is ridden with implicit values, the subject matter about which students are supposed to reason. In this article, we try to do justice to both kinds of comments; we will define critical thinking as entailing more than logical thinking, and we will define the skills and dispositions students need in the field of critical thinking from the perspective of '(critical) democratic citizenship education'.

Lastly critical pedagogues argued that critical thinking takes insufficient account of the social context (Giroux, 1994). Instead of 'reading the word', students should be taught to 'read the world' (Freire & Macedo, 1987). McLaren (1994) argues for a repositioning of critical thinking as a sociopolitical practice. The main concern should be the question of how to resist social injustice. In their overview of the main differences between critical thinking and critical pedagogy, Burbules and Berk (1999) point out that the strict distinction between facts and values in the critical-thinking tradition makes the consequences of certain knowledge on institutional and societal levels invisible. For our purposes too—enhancing critical thinking as a crucial aspect of critical and democratic citizenship—it is essential that a curriculum for critical thinking pays attention to the political effects of argumentation and reasoning.

4. Learning to think critically

Some studies have shown that students' thinking does improve through instruction (see Kennedy et al., 1991). Of course students' ability to understand and master critical thinking varies with age, and teaching needs to be tailored to the developmental level of students. However, even young children appear to be able to benefit from critical-thinking training. Kuhn (1999) gives a detailed picture of critical thinking as a developmental phenomenon. Different stages of epistemological beliefs in her view correspond with different roles critical thinking can assume. In the realist stage critical thinking is unnecessary; in the absolutist stage critical thinking is a vehicle for comparing assertions with reality and determining whether they are true or false; in the multiplist stage critical thinking is irrelevant (because by then everyone has his/her own truth); and finally in the evaluative stage critical thinking is valued as a vehicle that promotes sound assertions and enhances understanding. Kuhn suggests that educators who wish to foster critical thinking may gain from conceptualizing students' potential for critical thinking in such a developmental framework.

The articles about learning and instruction of critical thinking found in the literature search vary from arguments on the starting points for critical thinking to proposals for complete instructional designs, and detailed descriptions of teaching strategies or characteristics of learning environments, empirically evaluated or not.

4.1. How should critical thinking be taught?

The most comprehensive attempt to define what instruction aimed at critical thinking should look like has been made by Paul (1992, p. 303–304). According to Paul critical thinking is not *an* aim of education but *the* aim. It is more like a

'quality' of what is taught and learned. His proposals for instruction actually come down to a plea for a total educational reform, with consequences for curriculum goals, textbooks, assessment and staff development. In his book '*Critical thinking: What every person needs to survive in a rapidly changing world*' Paul shows how teachers can cultivate independence of thought in their students. For example, guidelines are formulated such as, 'rather than simply having students discuss ideas found in their texts, have them brainstorm their own ideas and argue among themselves about problems and the solution to problems', 'routinely ask students for their point of view on issues, concepts and ideas', 'whenever possible give students tasks that call upon them to develop their own categories and modes of classification instead of being provided with them in advance'. Paul argues that students learn best when their thinking involves extended exchange of points of view or frames of reference.

Paul's teaching strategies fit into a concept of critical thinking as 'good reasoning' or 'thinking in a disciplined way, according to intellectual standards'. Nevertheless, Paul's position comes closer to a critical pedagogical interpretation of critical thinking than his instructional guidelines seem to suggest, when he distinghuishes between critical thinking in the 'weak' and the 'strong' sense. 'Current methods [...] often inadvertently encourage critical thinking in the 'weak' sense. The most fundamental and questionable assumptions of these approaches (whether formal or informal) is that critical thinking can be successfully taught as a battery of technical skills which can be mastered more or less one by one without giving serious attention to self-deception, background logic, and multi-categorical ethical issues'.

Halpern (1998) explicitly addresses the issue of the transferability of critical-thinking skills on the basis of a developed model aimed at learning transfer skills. This instructional variant of the subject-specificity debate centers around the question to what extent critical-thinking skills must or can be taught in the context of specific subject matter. Whilst some scholars presuppose that critical thinking is the same across disciplines, and can therefore be learned in specially designed courses (e.g. Ennis, 1989; Paul, 1992), others argue that generalizable thinking skills do not exist, and thus critical-thinking skills cannot be learned in isolation from a subject (McPeck, 1981). Brown (1997) voices the current opinion that critical thinking must be taught in the context of specific subject matter, in such a way that transfer to other domains is possible. She argues that we cannot expect children to progress in the development of thinking unless we give them something to think about, in other words, unless we engage them in serious learning about meaningful, rich, domain-specific subject-matter. Brown points out the importance of using real-life problems. Two reasons are given for this. On the one hand, this is supposed to be motivating and stimulates students' active involvement. On the other hand, these are precisely the kind of ill-defined, messy, complex problems for which critical thinking is needed anyway (see also Halpern, 1998; Kennedy et al., 1991). Few guidelines exist, however, on how to achieve this.

In almost all studies on instructional procedures focussing on secondary and higher education 'discussion' and 'dialogue' play a key role (see also Commeyras,

1993). Dennick and Exley (1998), for example, discuss four methods of small-group teaching that enhance critical thinking: focused discussion, student-led seminars, problem-based learning, and role play. Other (partly overlapping) procedures mentioned are: fishbowling, the creative-controversy-model (Baloche, Mauger, Willis, Filinuk, & Michalsky, 1993) and the method of 'academic controversy' in cooperative groups (Johnson & Johnson, 1993).[2]

A number of articles concern the question how to promote critical thinking in specific school subjects. Delaney (1991) for example presents a discussion format for use in small-group environments in geography at the secondary and post-secondary level. In a journal on biochemical education Dennick and Exley (1998) discuss the advantages of small-group teaching for developing critical thinking. Cleland, Helion, and Fry (1999) discuss how teachers in K-12 physical education can promote critical thinking. Several teaching strategies are discussed, like 'promoting inquiry' and 'designing situations in which students make inferences'. In these articles with regard to enhancing critical thinking in specific domains, however, critical thinking is not very strictly defined and is often almost synonymous with problem-solving or active learning. Moreover, the proposed instructional designs are not tested.

Many of the procedures described above are forms of cooperative learning. Some authors refer to literature supporting the notion that cooperative learning and group discussion increases critical-thinking ability and competences, and promotes increased use of higher-order skills and higher-reasoning strategies. Davis (1992, p. 135) propounds that 'the extensive empirical evidence that cooperative learning enhances skill learning for a wide range of skills gives good reason to believe that this enhancement will extend to the skills of critical thinking. It sticks, however, to such presuppositions; empirical research is as good as lacking (see also Garside, 1996).

4.2. *Effective instructional strategies for critical thinking*

A large number of empirical studies in higher education have tried to ascertain retrospectively which instructional factors enhance critical thinking, by using large databases for analyses in which students' results in critical-thinking tests are related to characteristics of instruction. It proves impossible to demonstrate the effectiveness of courses or programs especially devised to improve critical thinking (studies

[2] In the '*fishbowling*' procedure the group is divided in an inner and an outer circle. While the students in the inner circle discuss a statement, the students in the outer circle listen to the discussion and observe one assigned classmate (the fish). Then students exchange seats (inner circle becomes outer circle, vice versa). Finally, students reflect on their observations. The '*creative-controversy-model*' and the method of '*academic controversy*' in cooperative groups are largely similar. The teacher divides the class into groups of four. Within each group the two pairs take opposite positions. Each pair must build a case for its position (and compare their ideas and evidence with members of other pairs who have prepared the same position in order to assimilate new ideas, etc.); present and defend their position; point out weaknesses, ask for justification and further evidence, and openly challenge 'opponents'; change perspective (pairs who support one position, must now support the other, and vice versa); reach consensus.

reviewed by Tsui, 1999). This may be interpreted as supporting the subject-specificity position, thus as arguing in favor of integrating critical thinking in the regular curriculum. Another interesting finding is that students who follow a course of study that requires the integration of ideas and courses across disciplines, and students who follow courses with an interdisciplinary approach, tend to show greater gains in critical thinking than other students (studies reviewed in Terenzini, Springer, Pascarella, & Nora, 1995; Tsui, 1999).

Tsui (1999) discusses a number of more specific instructional variables. For example, critical thinking scores were found to be higher for an instructional protocol focusing on the active attribution of meaning by students; courses emphasizing inquiry and higher-order thinking; courses utilizing feedback reflecting phrases or statements to increase the quality and quantity of student responses (dissertations reviewed in Tsui, 1999). Assignments to give class presentations, critical analysis of papers by instructors, and taking essay exams rather than multiple choice exams appeared to be positively related to students' self-reported growth in critical thinking (Tsui, 1999; see also Astin, 1993). Both Tsui and Terenzini et al. discuss Smith's (1977) findings that courses eliciting a high level (amount and cognitive level) of student participation, instructor encouragement, praise and use of students' ideas, and the amount of peer-to-peer interaction are positively related to gains in critical thinking. Terenzini et al. also mention studies indicating that a student's level of involvement both in the classroom may have important effects on the development of higher-order cognitive functioning (e.g. Pascarella, 1989).

However, significant effects of course characteristics that one would expect to enhance critical thinking are not always found. According to Tsui (1999) this may be due to limitations in traditional research approaches, including such factors as the period of time between pretest and posttest being too short, small sample sizes that typically involve a single institution, and broad measurement instruments.

Terenzini et al. (1995, p. 26) are critical of much of the research as all studies have adopted a segmented approach in their conceptual and methodological designs: 'the role of the curriculum is studied separately from the influences of methods of instruction, both of which are examined independently of classroom climate or instructor behaviors, and all of these academic sources of influence on critical thinking are assessed as if students' out-of-class experiences were unrelated to gains in critical thinking'. They set up a 1-year, longitudinal, panel study (two rounds of data collection, $N = 210$) that combines these factors.[3] Their own results indicate that students' classroom/instructional and out-of-class experiences both make positive, statistically significant, and unique contributions to gains in critical thinking above and beyond students' precollege characteristics and level of critical thinking.

[3] Critical-thinking skills were measured by the critical-thinking skills module of the Collegiate Assessment of Academic Proficiency. This module is a 32-item measure of students' abilities to clarify, analyze, evaluate, and extend arguments.

Tsui's (1999) own research (survey, $N = 24.837$ students from 392 colleges and universities) focused on how do ordinary class experiences, instead of specifically designed programs, courses or pedagogical approaches, impact students' critical thinking. In the study, a self-report instrument was used. Her results reveal that taking writing courses, interdisciplinary course, history courses, science courses, women's studies courses, math courses, foreign language courses, ethnic studies courses and enrolling in an honors program are each positively associated with self-reported growth in critical thinking. Moreover, self-reported growth in critical thinking is positively related to having a paper critiqued by an instructor, conducting an independent research project, working on a group project, giving a class presentation, and taking essay exams, but negatively related to taking multiple choice exams. Overall findings, however, suggest that the impact of classroom experiences on students' abilities to think critically is far weaker than one might expect or hope. Tsui concludes that the findings highlight the fact that classroom experiences are significant to students' development of cognitive skills, while suggesting that this influence can and should be much stronger. These findings do offer some insights as to which instructional techniques may be used in order to promote critical thinking in students. However, in order to ascertain the impact of particular teaching methods studies with an experimental design are needed.

Garside (1996) reported on one of the few examples of empirical research in which the relationship between a specific, theoretically substantiated teaching method and the development of critical thinking has been studied. An experimental study with a pretest–posttest design ($N = 118$) was conducted to answer the question whether group discussion facilitates the development of critical-thinking skills more than traditional methods of instruction such as lectures (measured by means of undergraduate students' demonstrations).[4] No significant difference was found between the two instructional methods in developing critical-thinking skills. Garside attributes this to students' lack of experience of group discussions.

Karabenick and Collins-Eaglin (1996) found in a survey study (54 college classes, $N = 1037$) that college students in classes with greater emphasis on collaboration and less emphasis on grades were more likely to use higher-order learning strategies and critical thinking. For measuring instruction questionnaires were used in which students could indicate the importance of several learning goals and teaching strategies used. For measuring learning and thinking strategies the 'Motivated Strategies for Learning Questionnaire' was used.

Tynjälä (1998) concluded on the basis of an experimental study in higher education ($N = 39$) that a constructivist learning environment[5] in an 11-week

[4] An objective test (true–false, multiple choice, and matching items) was used. The data were analyzed with help of Bloom's taxonomy (higher-order versus lower-order thinking skills).

[5] In this study, a 'constructivist learning environment' refers to a learning environment not focussing on rehearsal but on deep understanding (comparing different theories and approaches, analyzing different theories from the perspective of students' own experiences), conceptual change and developing metacognitive and critical-thinking skills. Moreover, in such an constructivist learning environment 'authentic assessment' is used instead of more traditional ways of testing.

educational psychology course enhances critical thinking more easily than a learning environment with a final examination (measured by means of self-reports). Students in the experimental group also developed more constructivist conceptions of learning.

4.3. Measuring critical thinking

An important question is how critical thinking and the growth in critical thinking can be assessed. In our review we found different types of assessment instruments. Use is being made of tests and self-reports. Tests ususally focus on critical-thinking skills, such as inference, recognition of assumptions, deduction, interpretation, and evaluation of arguments.[6] In the studies mentioned above some of these tests are used, others are (only) discussed. In the tests examples of argumentations are given, followed by questions that can be answered correctly or incorrectly. In general, the reliabilities of these tests are high. Allen, Berkowitz, Hunt, and Louden (1999, p. 20) point out the question of the validity of such tests. 'The Watson–Glaser test measures the ability of persons to follow the 'rules' involved in various forms of reasoning. To the extent that one can accept the underlying rules, the test is valid.' The use of self-report as a means of assessment is being justified on the basis of a number of studies that found moderate positive correlations between self-reports and seemingly objective measures (see Tsui, 1999). An example concerns the Motivated Strategies for Learning Questionnaire, including questions like: 'When I read or hear an assertion or conclusion in this class, I think about possible alternatives'. Finally, besides questionnaires, essays and informal interviews are used to analyze the reasons behind certain judgements. Paul and Nosich (see Gibson, 1995) have developed a program for critical-thinking assessment for the Schools 2000 project which involves a combination of objective tests and essays.

4.4. Summary

In Section 3, we discussed different interpretations of critical thinking. Our review of proposals for how to teach critical thinking in Section 4, however, resulted in a less diverse picture. On the one hand, in this part of the review we found theoretically informed proposals for instructional models or procedures aimed at the development of critical thinking. On the other hand, we came across empirical studies into the effectiveness of instructional strategies. Both, however, are mainly realizations of the 'instrumental' version of critical thinking aimed at thinking logically or rationally as formulated by philosophers, and the 'higher-order skills' version of critical thinking as formulated by educational psychologists.

Guidelines for teaching concern ways in which teachers can motivate, activate and instruct their students to argue logically and solve heuristic problems.

[6] For example, Watson–Glaser test, CAAP (Collegiate Assesment of Academic Proficiency) Critical Thinking module, Cornell Test of Critical Thinking, California Critical-thinking Skills.

Characteristics of instruction that are assumed to enhance critical thinking are: paying attention to the development of the epistemological beliefs of students; promoting active learning; a problem-based curriculum; and stimulating interaction between students. In addition to these characteristics, some authors stress the importance of using real-life problems for motivational reasons. Critical thinking is especially suitable for heuristic, ill-defined, messy and complex problems. Most researchers therefore agree that learning how to think critically should take place in the context of meaningful, rich, domain-specific subject-matter.

In empirical research in which instructional variables are retrospectively correlated with students' critical-thinking skills the importance of a large number of these characteristics is confirmed. This especially holds true for characteristics pertaining to stimulating the active involvement and contributions of students in the learning process, such as an elaborate interaction between students and between students and teacher, having students present their insights or formulate these in an essay-exam (instead of testing through multiple choice exams). Significant effects of such characteristics, however, are not consistently found. This is explained by the following factors: limited instruction time, a small sample and the use of too general measuring instruments. Some authors point at the importance of the interrelatedness of the curriculum, instructional strategies, teacher behavior and classroom climate. However, few studies combine these factors in one research design. Research also shows that special 'critical-thinking programs' are usually not resulting in transferable and durable effects. This confirms the subject-specificity position.

Finally, in this literature review we came across the problem of how to assess critical thinking. Assessment instruments can be divided into tests and self-reports. Similarly, the instructional variables included in large surveys that appear to contribute to the development of critical thinking are derived predominantly from an instrumental or higher-order skills perspective. Self-reports measuring critical thinking typically mention skills as 'being able to recognize presuppositions' and 'being able to think about alternatives'. The objective tests available focus predominantly on a student's competence to argue in a consistent and rational way. It abstracts from the social context in which arguments function. This is one of the reasons why various authors stress the importance of alternative tests such as essays or informal interviews.

5. Critical thinking in a social constructivist approach to learning

This second part of the article focuses on the question how to conceptualize critical thinking from the perspective of '(critical) democratic citizenship education' and on the instructional consequences of such a conceptualization. A plea is made for a social constructivist approach of critical thinking as an educational aim. Such an approach is appropriate in the light of our conceptualization of democratic citizenship, namely being able to participate in a pluralistic society in a critical and

aware manner, and also largely meets the critiques on critical thinking as outlined above.

We sympathize with critical pedagogues, who point out that critical thinking focuses too much on internal consistencies and pays too little attention to the political nature of arguments and reasonings (Giroux, 1994). Questioning power and the way it structures social relations and legitimates knowledge must be an inherent aspect of critical thinking (see e.g. Kaplan, 1991). We also subscribe to the validity of critiques of the cultural bias in the standards of critical thinking, and the conception of rationality that underlies them. These favor a particular masculine and western mode of thinking (see Burbules & Berk, 1999). In our view, democratic citizenship requires not only being able to think critically and politically, it also requires a caring attitude, empathy and commitment. To prepare students to this, instructional designs are needed that do not capitalize on applying tricks of arguing, nor on the cognitive activity of analyzing power structures, but contribute to the ability as well as the readiness of students to participate independently in a meaningful and critical way in concrete real social practices and activities. As a consequence of the criticism on the conception of rationality underlying critical thinking, the ethic of care should be taken seriously in a 'critical-thinking curriculum' (cf. Noddings, 1992).

Finally, a social constructivist approach also helps to interpret the main research results found in our review: Why do special 'critical-thinking programs' fail? Why is critical thinking stimulated by the use of heuristic, real-life problems? Why is cooperative learning in a non-competitive climate in the classroom so important?

5.1. *Redefining critical thinking*

In essence, social constructivist educational theories interpret learning as increasingly competent participation in the discourse, norms and practices associated with particular communities of practice. Whereas from the perspective of cognitive learning theory, learning pertains to the acquisition of knowledge and cognitive skills as transferable commodities (e.g. Anderson, Greeno, Reder, & Simon, 2000), a social constructivist approach shifts the focus to 'activities' and 'the process of becoming a member of a certain community'. Learning then is a constructive, and socially and culturally situated process. The participation metaphor is often used to characterize this conception of 'learning'. (Salomon & Perkins, 1998; Sfard, 1998).

The participation metaphor does justice to the fact that learning is inextricably bound up with identity formation. Becoming a more central participant in society is not just a matter of acquiring knowledge and skills. It also implies becoming a member of a community of practice. This requires people to see themselves *as* members, taking responsibility for their own actions (including the use of knowledge and skills) in that position. The learning process thus implies a change in personal identity, in the way one presents oneself to others and to oneself (cf. Holland, Lachicotte, Skinner, & Cain, 1998). Incorporating identity development in the definition of learning is the most typical difference between this social-

constructivist approach of learning and the approaches of authors like Brown (1997) and Tynjälä (1998).

In this section, we analyze how the participation metaphor can help in formulating an approach to critical thinking aimed at functioning in a pluralistic society with care, involvement and critical political awareness. We then pay attention to the question of how instructional designs can be developed to promote critical thinking that are compatible with the concept of 'learning by participating in communities of practice'. This involves analyzing how the results of the research in the first part of this article can be used.

To begin with, in the participation approach the educational objective must not be formulated exclusively in terms of critical *thinking* but rather in terms of acquiring the competence to *participate* critically in the communities and social practices to which a person belongs. This competence includes knowledge and skills and the willingness to use these (agency).

The learning process for this 'critical competence' occurs by being actively involved in meaningful social practices. From this perspective, the objective of critical thinking can never be realized by means of special 'programs for critical thinking' in which the relevant skills are taught as technical skills. If learning must be meaningful to the individual in order to contribute to identity development (Wardekker, 1998), it is essential that connections are made between the learning process and the current and future situation(s) in which students can and want to apply the knowledge and skills they have acquired (see e.g. Lave & Wenger, 1991). We found studies about promoting critical thinking in the literature search in which the authors emphasized the importance of meaningful domain-related topics. Ultimately, the students themselves have to learn to make the connection between the topic/discipline and the current context of agency (Cobb & Bowles, 1999). Education can help students by selecting suitable and engaging topics and assignments that encourage them to act.

From a participation perspective, learning to think critically is an inherently social process. The social character of learning is certainly recognized in the various studies on critical thinking discussed in the first part of this article. Cooperative procedures are considered to be highly valuable and 'social' instruction techniques such as discussion, student-led work groups, role playing and 'fish bowling' are frequently used. The social character of learning in these studies, however, can be described as 'socially mediated individual learning' (Salomon & Perkins, 1998). The social aspect of learning lies in the techniques and procedures that are used (working together, discussing, etc.). The ultimate goal of this way of learning remains the acquisition of individual knowledge and thinking skills, and sometimes dispositions (as entities). It is not so much a matter of 'creating a community' and 'becoming a participant' (Sfard, 1998).

5.2. Teaching strategies

What does learning to think critically as a social process at classroom level actually mean? In the first place it is important that students work on critical

competence in the context of specific school subjects and topics. These topics must refer to practical situations that students can relate to. The subject matter must relate to the world, to students' own position and that of others, and to students' opportunities to influence this position. It is not about critical thinking as such but about how, for example, an historical viewpoint can contribute to interpreting stories about a student's own neighborhood, ethnic group or gender, etc. in a critical fashion, or how an ecological view can contribute to dealing critically with the household refuse produced by students' own families. In the terminology of critical pedagogy, education that aims to promote critical thinking must stimulate students to participate in practices with the objective of improving the quality of society for everyone and to participate in the discussion on what exactly is 'quality'.

Interaction during lessons is also a practice in which students participate. The culture and dialogues in the classroom must encourage students to gain practical experience in the 'skills and dispositions' that our conceptualization of critical thinking involves. This is not only about issues such as 'being able to look at a problem from different perspectives (the ability to change perspective)' or 'being able to pinpoint the main issues and assumptions in a discussion or argument'. It also concerns skills and dispositions like 'being able to relate a question to one's own norms and values', 'being able to relate a question to general principles such as social justice, equality, respect and consideration', 'be open to and consider other people', 'daring to express a different opinion', etc. This is possible in many ways. Teachers can do this by not asking questions themselves but by giving students the responsibility for this (Commeyras & Sumner, 1998). The teacher can act as role model (and participant) but can also create conditions in which different perspectives within the learning community are confronted with each other. Examples of historical figures or novels that express or show critical competence can also fulfill a function. Students can practice 'deconstructing' facts by analyzing how they originated.

As well as the classroom, the school as the environment in which students live and learn can play an important role in promoting critical thinking. In an ideal situation students have a useful realistic context to develop the competences they need to have as critical citizens by participating in a culture in which these competences are necessary.[7] De Winter, Baerveldt, and Kooistra (1999) refer to this type of learning with the term 'children as fellow citizens'. We can illustrate this with the theme of 'the multicultural society'. More and more schools use this theme to stimulate critical thinking in the classroom, for example, in subjects like geography, history and social studies. Such a theme is also part of the school environment in which students live and learn. A realistic situation can certainly be created at this level in which students as participants can observe, imitate, critically reflect and practice. Hence as well as learning *about* intercultural education, students can

[7] The learning potential of the school as a social practice is also emphasized in 'Just Community Schools' (Power, Higgings, & Kohlberg, 1989); 'Democratic Schools' (Goodman, 1992) and 'Caring Communities' (Battistich, Solomon, Watson, & Schaps, 1997; Noddings, 1992).

become involved themselves in the realization of an intercultural school. Helping to create a safe, respectful environment for all students and teachers stimulates knowledge, skills and dispositions in students that they also need as critical citizens in a democratic society.

Does this mean that the instructional designs and procedures discussed in Section 4 ('Learning to think critically') are of no value at all? We do not think so. Even though they are based on different theoretical frameworks, the empirical studies that have been carried out do provide useful guidelines for promoting 'logical thinking' (philosophical approach) or 'higher-order thinking skills' (psychological approach), varying from techniques like 'fish bowling' to more general principles like attention to discussion and dialogue. These guidelines do need to be included in instructional designs with the aim of creating practical situations in which critical thinking and meaningful content are intertwined at both the level of the classroom and the school, if they are to further critical thinking as a competence required from citizens to be able to participate in a modern democratic society.

5.3. *Differences between pupils*

A social constructivist approach to promoting critical thinking does not by definition meet the critique of 'cultural bias'. Elements such as care, empathy and involvement are indeed emphasized as important aspects of the 'learning community' in which students learn to think critically. Scarcely any attention at all is paid to the undesirable effects of social differences between students as important characteristics of such a 'learning community' and the culture in which students learn. On the contrary. The advantages of working with heterogeneous groups are mostly dealt with in detail. Brown and Campione (1994) suggest that pupils profit most from each other's knowledge and skills when these differ within the group. In a learning community the emphasis is on communal responsibility and involvement (see Van der Linden, Erkens, Schmidt, & Renshaw, 2000). Moreover, a class in the form of a learning community not only presupposes open interaction and shared meanings, it contributes to them. As expressed by Sfard (1998, p. 9): 'the participation metaphor can lead to a new, more democratic practice of learning and teaching'.

Attention to social differences and social inequality, however, is necessary (for a further explanation of this see Ten Dam, Volman, & Wardekker, 2004). Firstly, because differences between pupils in a 'class as a learning community' can not only be conducive to open and equal communication, they can also be a hindrance. Moreover, because the instructional formats that have been developed to promote critical thinking comprise practices that are more accessible to some groups than others (for example, competition, open differences of opinion and asking 'why'). This means that ways of working must be developed for instructional formats which do not automatically choose competition, differences of opinion, etc. as a means of promoting critical thinking. Teachers must be aware of the fact that different groups of students will approach such ways of working differently.

Moreover, the ability to debate is not the only measure of critical thinking. Students' agency repertory is also an important criterion.

6. Conclusions

In this article, we have discussed the possibilities for promoting critical thinking in schools. First we examined the objective of critical thinking. We stated that critical thinking is an essential competence required by citizens to participate in a modern, democratic society; critical thinking enables citizens to make their own contribution to society in a critical and aware manner. Then we discussed the empirical research on instructional models for promoting critical thinking in education. In the literature we found different versions and definitions of critical thinking. Although our conceptualization of critical thinking is closest to the critical pedagogy version, instructional strategies only have been formulated and sometimes researched empirically from the 'instrumental' and 'higher-order skill' perspective of critical thinking.

In the second part of the article we explored a social constructivist approach to learning how to think critically. From this approach learning is an inherent social process, aimed at forming an identity in relation to specific social practices. The concept of 'participation' is a key concept in this: learning to think critically is conceptualized as the acquisition of the competence to participate critically in the communities and social practices of which a person is a member. If education is to further the critical competence of students it must provide them with the opportunity at the level of the classroom and the school to 'observe, imitate and practice' critical agency. Learning by participation always involves 'reflection'. The quality of the participation can be improved by reflection. We have emphasized, moreover, that learning contexts must be chosen which students can make sense of and hence have a feeling of responsibility to participate critically in the practice in question (identity development).

We conclude this article by formulating questions for further research aimed at promoting the critical competence of students from the perspective of developing citizenship. Such research should be designed as design experiments, in which models for teaching critical competence are developed and evaluated (Reigeluth & Frick, 1999). Within such a research program first and foremost, studies are necessary on the way in which different groups of students relate to the areas of critical, democratic citizenship (participation in politics, culture, labor, care, etc.). Such research is important because the results will help us to understand the differences between students (such as SES, ethnicity and gender) in learning processes and outcomes with the aim of promoting critical thinking. Which groups of students feel attracted to the objective of critical competence (acting critical and reflective), or conversely are repelled by it? How does 'being critical' fit in with their identity? Knowing about a subject or topic is not sufficient for a student to want to participate in the community of practice which that subject represents (see Volman & ten Dam, 1998). We can assume that the same applies to critical thinking. Hence an

emphasis on controversies as instructional strategy must be avoided as this reflects a western, individualistic, conflict-oriented interpretation of what critical thinking is. While 'debating' and 'taking opposing views' are stimulating for the individual personal development of one group of students, for another group of students, it may be 'working out the different perspectives of an issue together' and 'shared responsibility' that are stimulating. Although cross-cultural studies have been done in higher education on cultural differences in deep level versus surface level learning (e.g. Kember, 1996; Marton, Watkins, & Tang, 1997), research on cultural differences in approaches of critical thinking is as good as lacking. One of the few exceptions is the study of Peng and Nisbett (1999) on the differences in the preferred argumentation style of Chinese and American (under)graduate students.

A second research cluster concerns the question how the learning process in the classroom can be shaped in such a way that it is stimulating for everyone. From the theoretical perspective described above, this is a matter of creating opportunities for different groups of students to participate. Such research must be aimed at both the quantity and the quality of the participation. The latter in particular constitutes a virtually unexplored field of research. A possible first step would be to make a retrospective analysis of what typifies the way in which students participated in the class who seem to have acquired a greater level of critical competence in comparison to students with a lower level of critical competence within a particular domain (beginners in comparison to experts). Such research presumes valid ways of evaluating and valid measurement instruments.

This brings us to a next research theme. There are still no appropriate instruments available for measuring the 'critical competences' of students. Our review showed that dissatisfaction with the existing 'objective tests' has given rise to an exploration of alternative tests such as essays and informal interviews. However, such tests can still be aimed at measuring the ability to reason in a consistent and rational way. Our conceptualization of 'critical competence, however, asks for ways of measuring the quality of the 'critical action repertory' of students and the development thereof. Such measures should probably be based on a portfolio in which students collect 'evidence' of their critical competence.

The question of promoting metacognitive knowledge and skills deserves separate attention. In the literature review we were confronted with the importance of metacognitive competence for critical thinking. Seen from the perspective of citizenship, metacognitive knowledge and skills help students to react in an active and flexible way in a diversity of social situations. In general, research on teaching metacognitive knowledge and skills is still at a very early stage (De Corte, 1998). Almost no research has been done on the question of how metacognitive knowledge and skills can be stimulated in students in the lower strands of education. As the development of citizenship by definition involves *all* students, it is important to obtain more insight into the possibilities or lack thereof for stimulating reflection in this group of students.

Finally, we pointed out above how research at both the level of the classroom and of the school as an environment to live and learn in is relevant to the issue of 'learning by participation'. Research on 'learning to think critically' has mainly

focused until now on instructional strategies or other variables at the level of the classroom. Further research is required on the characteristics of the school culture and school organization that in conjunction with or in addition to characteristics at the level of the classroom promote critical thinking in students.

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