International Journal of Educational Research Open 10 (2026) 100563

Contents lists available at ScienceDirect

International Journal of Educational Research Open

journal homepage: www.elsevier.com/locate/ijedro

Arguing for democracy: Promoting argumentation literacy in civic education in Switzerland

Liliane Wenger, Manuel S. Hubacher *, Açelya Aydin, Monika Waldis

Centre for Civic Education and History Didactics, FHNW School of Education/Centre for Democracy Studies Aarau (ZDA), Küttigerstrasse 21, Aarau, Switzerland

ARTICLE INFO

Keywords:
Argumentation literacy
Argumentation training
Civic education
Transactivity

ABSTRACT

Deliberative democracy theories emphasise the importance of communicative engagement in civic opinion formation. Therefore, civic education should enable students with the skills to participate in deliberative processes, fostering argumentation literacy understood as both a linguistic and a political competence. This study examines how a teaching unit designed to promote transactive dialogue among 8th and 9th-grade (ISCED 2) students influences the quality of classroom debates. The unit combined a modified version of Gronostay's argumentation training, teacher-designed thematic input, and a structured fishbowl debate format. Conducted during the 2022–2023 school year, the study involved four experienced teachers and their respective classes. Despite identical training and debate structures, the quality of student debates varied substantially across classrooms. All discussions began with one-sided arguments, but some evolved into extended critical and responsive exchanges, reflecting a higher level of transactive dialogue. This variation may be attributed to differences in the thematic input provided by each teacher, suggesting that the nature of didactic scaffolding merits further investigation.

Introduction

The act of arguing is regarded as the gentlest and the only legitimate means of social self-assertion within democratic societies (Habermas, 2005). From the perspective of deliberative democracy in particular, political argumentation in the context of public discourse is therefore the mode of politics (Bächtiger et al., 2018; Gutmann & Thompson, 2009). Democracies rely on citizens who can form independent opinions and articulate them through reasoned arguments.

For civic education, this implies fostering the competencies and attitudes necessary for political argumentation and democratic dialogue. However, the competencies required for effective argumentation are complex and multifaceted. Research indicates that while young children do engage in argumentation, their reasoning often lacks explicit conclusions and justifications (Anderson et al., 1997). Informal argumentation skills continue to develop throughout adolescence, highlighting the need for focused argumentation training during this formative period (Kuhn & Moore, 2015).

Argumentation is a multifaceted cognitive process which requires students not only to articulate a position clearly but also to understand opposing viewpoints and integrate critical feedback into the refinement of their own claims (Kuhn & Moore, 2015; Mundwiler et al., 2017). This demands a dual focus: maintaining one's own perspective while simultaneously engaging with that of others. Studies in civic education underscore the challenges students face in linking their arguments to those of their peers (Jahr et al., 2016; Petrik, 2016). Addressing these challenges, Gronostay (2017) developed an argumentation training unit designed to equip students with practical tools for civic discourse. Her findings reveal that while students improve in opposing claims after the training, they still struggle to incorporate opposing viewpoints into the development of their own arguments. This persistent difficulty in integrating diverse perspectives points to the need for further exploration of how instructional design can better support transactive argumentation.

This qualitative study investigates how an adapted version of Gronostay's argumentation training, combined with teacher-designed thematic inputs, influences subsequent classroom discussions, focusing in particular on transactivity as a central indicator of discussion quality.

* Corresponding author.
E-mail addresses: liliane.wenger@fhnw.ch (L. Wenger), manuel.hubacher@zda.uzh.ch (M.S. Hubacher), acelya.aydin@fhnw.ch (A. Aydin), monika.waldis@fhnw.ch (M. Waldis).

https://doi.org/10.1016/j.ijedro.2025.100563

Available online 3 December 2025

Conceptual and theoretical background

Deliberative democracy: ideals and challenges

Deliberative democracy extends liberal and republican conceptions by incorporating communication theory and epistemological considerations (Landwehr, 2012, p. 355). At its core, it focuses on mutual communication about public matters, where free and equal citizens and their representatives deliberate on preferences, values, and interests to make binding collective decisions for the present (Bächtiger et al., 2018, p. 2; Gutmann & Thompson, 2009, p. 7). Political deliberation serves both as a mode of the democratic process and as a source of legitimation. While deliberative practice aims to include all stakeholders in decision-making, making the addressees of law to its authors, participation is not an end in itself. Rather, the quality of decisions supersedes mere participation (Landwehr, 2012, p. 358).

What constitutes good political deliberation remains contested (Bächtiger et al., 2018), but several core principles emerge in the literature. These include mutual respect as a universal ideal (Gutmann & Thompson, 1996), manifested through active listening and genuine efforts to understand others' perspectives (Bächtiger et al., 2018); equality in the form of equality of opportunity for political influence, though not necessarily equal persuasive power (Knight & Johnson, 1997); and the absence of power as a precondition for argumentation aimed at intersubjective understanding (Habermas, 1981/1984, p. 25). 'The unforced force of the better argument' (Habermas, 1996, p. 305) should govern deliberation, compelling reconsideration of positions through reasoned discussion rather than through coercion. Moreover, contemporary approaches acknowledge that relevant considerations or communicative acts beyond rational arguments can also constitute legitimate aspects of deliberation (Mansbridge, 2015).

While earlier literature identified consensus as deliberation's ideal (Cohen, 1989/2005; Habermas, 1962/1991), contemporary perspectives acknowledge that pluralistic contexts may require alternative forms such as meta-consensus (Dryzek & Niemeyer, 2010) or overlapping consensus (Rawls, 1996). Orientation towards the common good remains an ideal of good deliberation (Cohen, 1989/2005; Habermas, 1962/1991), though self-interest may be appropriate when tempered by considerations of fairness and respect for others' rights (e.g., Mansbridge et al., 2010).

From a civic education perspective, deliberative discourse is recognised as both an important pedagogical method and central goal. Such discourse offers opportunities to make plurality tangible and to strengthen democratic attitudes (Gutmann, 1987; Hess & McAvoy, 2015; Peterson, 2009; Youniss & Levine, 2009). Habermasian approaches emphasise introducing students to rational decision-making through discussing controversial topics[1] in class (Drerup, 2021; Hess, 2009),[2] practicing political virtues such as respect and tolerance, the duty to give reasons, and a sense of fairness. Civic education is thus tasked with introducing deliberative procedures and discussion, fostering exchanges of opinion, and training argumentative and judgement skills (Dewey, 1996). Understanding contrasting perspectives enables students to expand and better justify their own thinking, actions, and judgements (Müller, 2022, p. 234).

However, political deliberation and deliberative education face significant challenges. Young (2000, pp. 44, 63–77) critiques that the exclusive focus on rational argumentation privileges educated, white, middle-class heterosexual men over less privileged groups more familiar with alternative communicative practices such as storytelling.[3] Moreover, the pressure for consensus in deliberative debates may suppress dissent – a concern shared by Mouffe (e.g., 2013). She argues that plurality cannot be reduced, making conclusive answers to political questions impossible. Thus, political decisions should not be permanent to prevent hegemonic outcomes. Empirical challenges include groupthink, informational cascades, and group polarisation, which can undermine deliberative dialogue (Sunstein & Hastie, 2015). Hess and McAvoy's (2015) research suggests that these concerns are relevant for educational settings, finding that privileged students dominated discussions and that ideologically homogeneous classes risked polarisation.

Drawing on Bächtiger (2011), Pettit (1997), and Curato et al. (2013), Graff (2022) therefore advocates for deliberative educational formats that 'place explicit emphasis on confrontation and dissent within the format' (p. 622). Deliberative education understood this way must incorporate agonistic elements to reveal the hegemonic nature of political decisions and emphasise their potential adaptability. Such a contestatory deliberative approach acknowledges the limitations of traditional deliberative models while preserving their democratic potential.

Having established the normative framework of deliberative democracy, we now turn to argumentation theory to examine the communicative practices through which deliberation occurs. As noted, deliberation requires citizens capable of justifying their positions with generalisable arguments while critically examining others' reasoning (Landwehr, 2012, p. 360). Understanding argumentation as a dialogical process allows us to analyse how the ideals of deliberative democracy – mutual respect, equality, and reason-giving – manifest in actual discourse.

Argumentation theory: dialogical processes and transactive discourse

Consistent with our grounding in deliberative democratic theory, we conceptualise argumentation as a dialogue-based process. Since the term argumentation can denote both the act of arguing and the result of several arguments (van Eemeren & Grootendorst, 2003, p. 1), clarification is necessary.

In this study, *argumentation* refers specifically to the result of multiple arguments. It denotes a rational, verbal, and social activity attempting to support a controversial conclusion (Grundler, 2011, p. 44; Kopperschmidt, 2014, pp. 43, 59; van Eemeren et al., 1996, p. 5) through a sequence of arguments (Walton, 2006, p. 25). Thus, argumentation constitutes a sequence of speech acts that together create a network of relationships between statements (Kopperschmidt, 2014, p. 59). While argumentation represents the intended outcome of arguing, it can only be reconstructed retrospectively (Grundler, 2011, p. 47).

The *act of arguing* represents a complex, dialogical linguistic action by an individual or group consisting of providing arguments (Kopperschmidt, 2014, p. 59). This action is grounded in shared concepts and epistemological principles co-constructed through joint speech (Grundler, 2011, p. 47). The act of arguing entails supporting questioned validity claims through cooperative speech. It succeeds when the speaker can successfully support their claim's validity (Kopperschmidt, 2014, p. 75) through rational arguments.

An *argument*, as a component of argumentation, consists of a sequence of interlocking statements that support a conclusion (Shapiro & Kouri Kissel, 2000). In informal logic, an argument is viewed as an attempt to resolve disagreement by supporting a position with reason (Groarke, 2021). As a system of interlocking statements (e.g., Toulmin, 1958/2003), an argument aims to support the conclusion and its validity claim (Grundler, 2011, p. 47; Kopperschmidt, 2014, pp. 43, 59; Walton, 2006, p. 1). The communicative action of stating an argument intends to

[1] A controversial topic is as an authentic issue about which public policies should be implemented to solve public problems (Hess, 2009, p. 5).

[2] Conversely, however, this does not mean that only discursive formats should be used (e.g., Drerup, 2021).

[3] This happens, for example, when the positions of less privileged groups are characterised as irrational or sentimental (Young, 1990, pp. 102–116).

persuade discourse participants to accept descriptive or normative statements as valid (Habermas, 1996). As previously mentioned, active listening and a sincere effort to understand others' perspectives are essential to constructive political deliberation (Bächtiger et al., 2018). Consequently, failing to justify a claim, and thus impeding its comprehension, clearly indicates weak argumentation. Conversely, argument quality potentially increases with justifications that support controversial claims, as this allows discourse participants to evaluate an argument's merit more easily and respond accordingly.

While argumentation as result, arguing as process, and argument as building block are analytically distinct, they are interrelated in practice. Understanding this distinction is crucial for analysing classroom debates, where students must simultaneously construct individual arguments while engaging in the broader act of arguing.

Oral argumentation as interactive practice

The *act of arguing orally* is inherently interactive (Luginbühl & Müller-Feldmeth, 2022), characterised by simultaneity and co-construction, with participants planning, producing, and reproducing arguments concurrently (e.g., Mundwiler et al., 2017). Compared to written arguments, oral arguments tend to be more implicit, fragmented, and sometimes barely recognisable (Luginbühl & Müller-Feldmeth, 2022). For reasons of linguistic economy, speakers tend not to explicitly state assumptions that they consider self-evident or part of general knowledge (Anderson et al., 1997). Speakers may also omit explicit statements for strategic reasons, for example, to shift the burden of proof onto the listeners (Macagno & Damele, 2013). The quality of oral argumentation can thus be evaluated not only by examining the coherence and completeness of argument structure, but also by taking the discussion context into account (Osborne et al., 2004).

Dialogues assume different forms depending on the objective (Walton, 2006), with fluid transitions between dialogue forms (Walton, 1989). Persuasive dialogue and deliberative dialogue are particularly significant in political discourse. *Persuasive dialogue* (e.g., pro/contra debates) aims to convince others to accept a controversial position through rational arguments (Walton, 1989, 2006), with participants defending their position by refuting criticism and objections (Felton et al., 2009, 2015) and rejecting alternative positions. *Deliberative dialogue*, by contrast, coordinates goals and actions to determine the best available course of action (Walton, 2006) through clarification, integration, and cooperative examination of options (Felton et al., 2015).

Regardless of the dialogue's form, speakers in oral argumentation must read the discourse context to appropriately situate their utterances. Oral production 'must always be contextualised, situated, and designed for a very specific audience and the current conversational situation' (Luginbühl & Müller-Feldmeth, 2022, p. 2). The social component of oral argumentation is crucial for understanding its interactive and procedural nature. Socio-emotional aspects – willingness to revise one's own opinion and open-mindedly encounter others' claims – are fundamental to shared understanding and thus productive dialogue (Wells & Arauz, 2006). This co-construction requires balancing intersubjectivity and alterity, meaning that dialogue participants must create meaning together while demarcating their differences. As Koschmann (1999) describes through the concept of *dialogicality*, dialogue participants must articulate their own ideas as speakers while simultaneously comprehending others' opinions as listeners. This connects principles of good deliberation – mutual respect, equality, the need to give reasons – with conditions for good oral argumentation.

Transactivity as a feature of high-quality discussions

The co-constructive nature of oral argumentation makes *transactivity* – the 'reasoning that operates on the reasoning of another' (Bachmann et al., 2015, p. 402) – a key feature of high-quality in-depth discussions (Gronostay, 2017). Transactive oral argumentation demands a dual focus aligned with dialogicality: dialogue participants must develop and adjust their position while critically engaging with others' positions. If, as argued previously, explicitly justified claims are more accessible, they might foster opposition or co-construction, thereby leading to more transactivity. This supports the assumption that explicitly justified claims are a quality feature of good argumentation.

Vogel et al. (2016, pp. 479–480) distinguish between *dialectic transactivity*, where disagreements are addressed directly, putting opposition at the centre of learning, and *dialogic transactivity*, focused on the co-construction of meaning. This demanding task (Kuhn & Udell, 2007) of coordinating perspectives through speech acts is necessary for argument reappraisals and high-quality discussions (Gronostay, 2019, p. 144).

Analysing transactivity: leitão's model

As mentioned previously, analysing oral argumentative reasoning is challenging due to its fragmented and implicit nature. In this context, Leitão's (2000) model of argument reappraisal proves helpful, tracing subtle knowledge-building processes and belief reconsideration in argumentative discourse. A key insight is that discussions on controversial issues rarely result in complete position shifts. Subtle argument changes, such as the use of qualifiers, are more likely. Leitão identifies eight argument fragments to analyse the interplay between contradiction and belief adaptation: initiating a new line of reasoning, formulating an objection (supporting the other side, questioning the claim's truth, or questioning reason-position links), and responding to objections (dismissing them, locally agreeing with them, integrating them, or withdrawing one's initial position) (Leitão, 2000, pp. 343–352). Transactivity generally increases with the number of moves employed to critically evaluate externalised arguments, such as counterarguments or rebuttals. However, not all argumentative contributions carry equal weight in transactive discussions (Gronostay, 2017, pp. 78–79). In particular, rebuttals, integrations, and co-construction are crucial for critically engaging with and incorporating others' arguments. Rebuttals directly challenge assertions (Gronostay, 2014), helping to identify flaws or misinformation. The purpose is to either weaken the opponent's stance or strengthen one's own. In doing so, rebuttals prevent endless cycles of opposition by encouraging critical evaluation of the claims being made (Erduran et al., 2004). Integrations involve refining one's argument in response to criticism, showing reasoning development and improving argument quality. Co-construction occurs when discussants collaboratively build arguments through agreement, elaboration, or continuation, which also signals strong argumentative engagement.

However, contestatory deliberative educational settings, which we argued for in the previous section, are not purely deliberative. The introduction of agonistic elements means that settings are at least partially comparable to persuasive dialogues. In those contexts, explicitly withdrawing one's position is considered a poor rational strategy (Felton et al., 2009, p. 422; Gronostay, 2016, p. 44). Nevertheless, implicit concessions remain possible, typically manifesting in two response types (Gronostay, 2016, p. 44): either adapting arguments by *integrating* opposition through qualification or providing additional support, or *dismissing* opposition by challenging its validity. Even in persuasive dialogues, Leitão's argument fragments enable the identification of increasing levels of transactivity by categorising argumentative sequences into three types: *one-sided argumentation* (unchallenged initial argument), *critical argumentation* (initial argument met with opposition), and *responsive argumentation* (response to opposition through integration or counter-challenge; see Fig. 1).

Contestatory deliberative educational settings to promote argumentation literacy

Having examined both the normative foundations of deliberative democracy and the mechanics of argumentative discourse, we now explore how these theoretical insights translate into pedagogical practice. Understanding argumentation theoretically as a dialogical, transactive process has pedagogical implications and raises the question: how

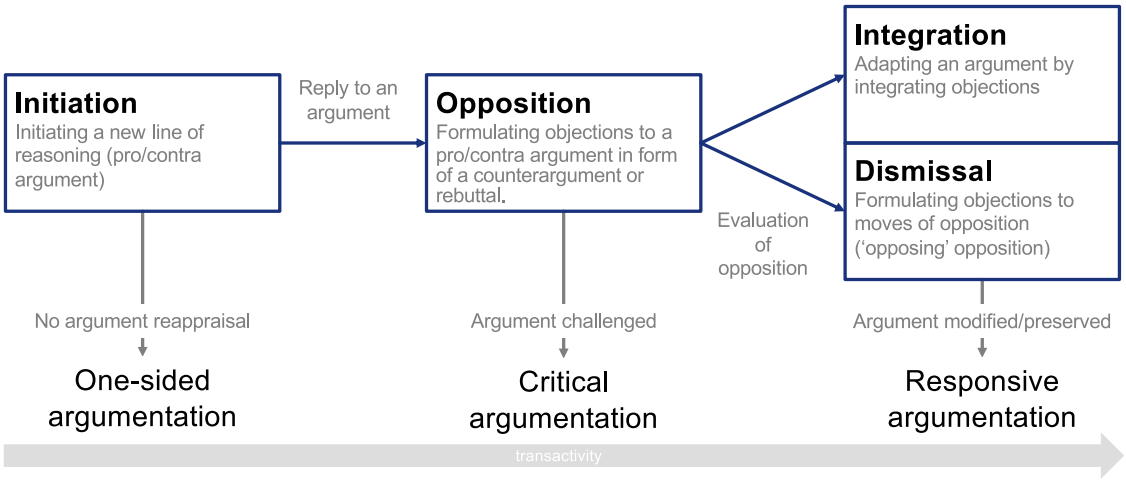

Fig. 1. Model of argument reappraisal based on Gronostay (2016, p. 44) and Leitão (2000, p. 57).

can educational settings apply these theoretical insights to develop students' argumentation literacy, particularly in civic education contexts?

From a civic education perspective, argumentation literacy encompasses not only the ability to formulate and evaluate arguments in a political context, but also the willingness and ability to engage constructively in democratic dialogue. This calls for certain democratic attitudes (e.g., upholding political equality, tolerance, or fairness; Hess & McAvoy, 2015), a commitment to reason-giving (Detjen et al., 2012; Hess & McAvoy, 2015), an understanding of the political landscape to contextualise arguments, the ability to weigh reasons (Hess & McAvoy, 2015), and the capacity to develop one's own position (Detjen et al., 2012; Hess & McAvoy, 2015). Linguistic aspects, such as linguistic coherence or expressiveness, must also be considered. Argumentation literacy is thus both a linguistic and a political competence (Kopperschmidt, 2014, pp. 114–115; Rapanta & Felton, 2022; Zohar & Nemet, 2002), which must be specifically taught and practised in class (Detjen et al., 2012, p. 84; Goll, 2012, p. 193; Richter, 2012, p. 178).

Effective approaches to fostering argumentation literacy

International studies provide empirical insight into effective approaches to fostering argumentation literacy. Three related aspects appear to be important: (i) dialogical and collaborative methods, (ii) reflection and metacognition, and (iii) interdisciplinary integration.

Research demonstrates the effectiveness of continuous, peer-based dialogical practice for the development of argumentative skills. Programmes such as 'Argue with Me' (Iordanou & Rapanta, 2021) illustrate the potential: dialogical argumentation, sometimes over several years, leads to significant improvements in argumentative skills – especially among lower-performing students (Crowell & Kuhn, 2014; Iordanou & Rapanta, 2021; Kuhn & Crowell, 2011). In addition, studies have demonstrated a transfer of argumentative skills to new topics and task formats (Iordanou & Rapanta, 2021; Zhang et al., 2023).

Reflective elements – in particular, consciously examining one's own and others' argumentation strategies – promote the development of strategic and metacognitive skills, which are essential for differentiated argumentation. Empirical findings support the idea that targeted reflection during and after argumentation phases strengthens students' ability to refute counterarguments and improve their own argumentation (Iordanou, 2022; Iordanou & Rapanta, 2021).

Promoting argumentative skills is a transdisciplinary and interdisciplinary task for various subject areas such as language teaching, history teaching, science teaching, and civic education. Studies suggest that argumentation-based curricula implemented in various subjects significantly improve oral argumentation skills. Students who participated in such programmes achieved significantly better results in oral and written argumentation tasks than control groups (Rapanta, 2021; Rapanta & Felton, 2022). Dialogical formats such as debates, peer dialogues, and interdisciplinary projects appear to promote the ability to structure arguments, recognise opposing positions, and argue on the basis of evidence (Crowell & Kuhn, 2014; Rapanta, 2021; Rapanta & Felton, 2022).

Domain-Specific findings in civic education

Findings from the field of civic education can be interpreted as supporting the general findings. However, they also highlight domain-specific aspects. In civic education contexts (e.g., pro and con debates, fishbowl discussions), subject-specific argumentation training can have a positive influence on both the quality of the arguments and the argumentative transactivity (Gronostay, 2017). Dialogical and discursive methods not only promote argumentative literacy, but also democratic values such as tolerance, empathy, and inclusion. Innovative curricula based on dialogical argumentation and cultural literacy have been shown to have positive effects on the participation and reflective abilities of young people in various European contexts (Garcia-Mila et al., 2021; Luís & Rapanta, 2020).

A key success factor is the quality of teaching. An open classroom atmosphere, cognitive activation, and targeted reflection are crucial for the effectiveness of political education and the development of argumentative skills (Alscher et al., 2022). Programmes that focus on critical reflection, diversity, and the inclusion of marginalised groups also appear to be effective in strengthening political agency and engagement (Keegan, 2021; Nelsen, 2021).

Dual purpose of classroom argumentation

The multidimensional nature of argumentation literacy raises important questions about how best to promote it. Research on classroom-based argumentative practices provides valuable insight and implies that classroom argumentation offers broad, domain-general benefits. Engaging in argumentative discourse supports structured thinking and encourages the exploration of alternative perspectives (Kuhn et al., 2017; Larrain et al., 2019; Nussbaum & Edwards, 2011; Reznitskaya et al., 2009). It also contributes to a more differentiated understanding of subject matter (Asterhan & Schwarz, 2007; Iordanou et al., 2019; Zohar & Nemet, 2002) while promoting the development of content-related knowledge and domain-specific concepts and competencies (Gronostay, 2019; Rapanta et al., 2013).

As a pedagogical method, the act of arguing promotes critical thinking, problem-solving skills, and decision-making capacities relevant to individual and social life (e.g., Kuhn, 2005, 2019; Osborne, 2013; Rapanta, 2021). Argumentation thus serves dual purposes:

strengthening argumentation skills (*learning to argue*) and promoting knowledge, understanding, and epistemic strategies (*arguing to learn*).

Challenges: emotional and intuitive dimensions

However, empirical findings from socioscientific issue (SSI) research indicate that in controversial science classroom discussions, students' arguments are shaped by more than rational thinking alone. While often rational, these arguments are also influenced by intuitive, emotional responses (Sadler & Zeidler, 2005) and tend to be grounded in personal values and lived experiences (e.g., Albe, 2008; Lee, 2007). Similarly, political controversies frequently involve topics that relate directly to students' personal lives or immediate environments (e.g., environmental protection). This personal relevance provides teachers with opportunities to connect curricular content to students' experiences, which may potentially increase engagement and motivation.

This familiarity with political issues can also promote heuristic assessment processes, based on quick, experience-based reasoning shortcuts (e.g., Acar et al., 2010). Additionally, research in civic education has indicated that political controversies frequently provoke spontaneous, unreflective moral judgements in students (Massing, 2003). This creates a significant pedagogical challenge in designing argumentation-based approaches for civic education, which must choose between fostering a domain-specific focus (e.g., political reasoning) and promoting cross-disciplinary integration that balances personal engagement with critical, structured analysis (Gronostay, 2019, p. 65). While civic education literature highlights the value of controversy in fostering critical judgement (e.g., Drerup, 2021; Hess & McAvoy, 2015), uncertainty remains about how civic education lessons should be effectively structured to achieve their goals (Manzel & Weißeno, 2017, pp. 60–61).

Empirical research in civic education pedagogy indicates that action-oriented formats such as pro and con debates with minimal teacher intervention foster more in-depth discussions, where students more frequently reference and respond to each other's arguments (Thormann, 2012a, p. 116). Assigning clear roles, such as pro and con positions, also appears to promote both engagement with opposing viewpoints and the expression of individual perspectives. Moreover, research suggests that these formats are well-suited to creating a meaningful link between the political micro and macro levels with the aim of fostering democratic conflict-resolution skills (Thormann, 2012b, p. 332, 2012a, pp. 117–119).

Furthermore, empirical evidence in educational psychology indicates that students in deliberative settings demonstrate greater willingness to engage with opposing arguments and to revise their own positions compared to those in competitive settings (Felton et al., 2015). Deliberative settings lead to increased self-reported respect for and understanding of others' positions (Avery et al., 2013) and enhanced willingness to consider diverse viewpoints (Hess & McAvoy, 2015, pp. 52–57). Additionally, student dialogues in small groups facilitate argumentation skills acquisition (Rapanta & Felton, 2022; Schuitema et al., 2011).

In summary, engaging in classroom argumentation supports the exploration of alternative perspectives and deepens students' understanding of their own views while enhancing subject-specific knowledge. Additionally, discussing controversial topics in the classroom can promote political reasoning and critical judgement – provided that the educational setting is carefully chosen. Deliberative debate formats with clearly defined roles and small group discussions appear to encourage both students' appreciation of differing viewpoints and their ability to reflect on their own positions. We can thus expect classroom debates about a controversial or contested topic to promote students' argumentation literacy.

Approaches to argumentation instruction

We have previously argued that argumentation literacy is a key competence that must be explicitly taught and practised in the classroom. To participate effectively in classroom debates – and thereby develop both political and linguistic skills – students need to learn how to construct and present arguments competently. Current research on fostering argumentation in educational settings is divided between two contrasting perspectives: the non-instrumental and the argument-oriented approach (Rapanta & Felton, 2022, p. 478).

The *non-instrumental approach* views argumentation as a natural outcome of engaging in dialogue. From this perspective, dialogic interactions, such as asking open-ended questions, emerge organically as part of exchanging ideas and perspectives, and structured instructional goals are considered unnecessary (Clarà, 2023). Dialogues, in this case, are seen as inherently sufficient for promoting argumentation.

In contrast, the *argument-oriented approach* emphasises the need for purposeful instructional framing. Here, dialogue is used strategically to foster stronger, more well-developed, and coherent arguments. The primary focus is not on dialogue for its own sake, but rather on cultivating the ability to argue effectively through structured, goal-oriented engagement (Chen et al., 2016; Zohar & Nemet, 2002).

We understand argumentation literacy as a skill that requires deliberate educational support to develop and thereby align with the latter perspective, which prioritises structured instructional framing for argumentation training. Moreover, establishing shared norms in argumentative peer discussions fosters students' understanding of epistemic standards underpinning effective argumentation (Kuhn et al., 2013). Practising argumentation strategies, for instance, encourages transactive dialogue and critical engagement with opposing arguments, though it does not necessarily lead to modifications in one's own arguments (Gronostay, 2016).

Scaffolding and training effectiveness

Research in educational psychology has demonstrated that learning environments incorporating structuring aids and scaffolding measures can significantly enhance the effectiveness of student-centred and semi-autonomous approaches, such as problem solving or cooperative small group work (Mayer, 2004; Stegmann et al., 2012). Novices appear to benefit from a prolonged use of scaffolds in order to develop robust argumentation skills (Tawfik et al., 2018). However, gradually reducing scaffolds as students gain competence, so-called *adaptive fading*, may benefit especially dialogic argumentation (Schwaighofer et al., 2017). Adaptive fading is most effective when paired with peer monitoring, self-assessment, or automated feedback tools (Cai et al., 2025; Noroozi et al., 2018). Even short-term interventions have the potential to improve students' argumentation skills (Hefter et al., 2014, 2018; Wertgen et al., 2025).

Nevertheless, research on the effectiveness of structured argumentation training in civic education remains limited. In an intervention study (grades 8 and 9), Gronostay (2017) combined thematic input with training that included analytical tasks and oral practice. Students in the experimental group subsequently exhibited more transactive speech acts, such as counterarguments and rebuttals, during fishbowl discussions. The revision and adaptation of their own arguments, however, remained largely absent. Furthermore, the argumentation training did not lead to higher argument quality. Students with and without the training predominantly produced unjustified claims.

This points to the need for further empirical research on the interplay between structured training, teacher-mediated thematic scaffolding, and subsequent discussion quality. Research needs to examine not only whether training improves argumentation skills, but also how contextual factors – such as teacher input and classroom dynamics – shape these outcomes.

Current study

This study forms part of the larger research project *Argumentieren und Urteilen in der Politischen Bildung auf der Sekundarstufe I*[Arguing and Judgement-Making in Civic Education at Lower Secondary Level]. The

project aims to establish foundational principles regarding the characteristics of and conditions for promoting argumentation and judgement-making in civic education in lower secondary schools in Switzerland and to empirically evaluate their effectiveness.

The project is divided into two phases. In the first exploratory phase, which is the focus of this study, we developed and tested a lesson unit designed to help lower secondary school students develop their political argumentation and judgement skills. This unit is inspired by Gronostay's (2017) work and formed the foundation for the second experimental phase of the project. In the second phase, we will investigate whether the lesson developed in the first phase significantly improves the quality of arguments used during debates, leads to more transactive interactions in students' discussions, and improves the quality of the written justification of judgements.

This paper reports on an exploratory study that introduces a lesson unit, combining a contestatory-deliberative approach, small-group dialogue, and argumentation training. We assess debate quality and transactivity to understand how these elements interact in classroom practice and what factors may influence discussion outcomes. A comparison of oral argumentation and written judgements will be addressed in Phase 2. We address three research questions (RQ) that examine argumentation at different analytical levels:

1. RQ 1 (micro level): As coherently and exhaustively structured arguments are an indicator of high-quality argumentation (Gronostay, 2017, p. 77), we would like to know: What is the structure of the arguments presented?
2. RQ 2 (*meso* level): The model of argumentative reappraisal (Gronostay, 2019; Leitão, 2000) implies that we can expect four different kinds of argumentative moves (initiation, opposition, integration, or co-construction) in classroom debates. Therefore: What is the distribution of different argumentative moves in argumentative reappraisal processes?
3. RQ 3 (macro level): Based on the argumentative moves, sequences with different levels of transactivity can be identified according to the model of argumentative reappraisal. These sequences can also be understood as indicators of different levels of argumentative quality (see, Erduran et al., 2004). This raises the question: What is the level of complexity of argumentation and how are transactive argumentative sequences and non-transactive argumentative sequences distributed?

Research design

We adopted a participatory approach for developing the lesson unit on a moderately controversial topic and collaborated with teachers. They piloted their individual versions of the unit in their respective classes while at least one member of the research team was present. The lessons were video-recorded and then analysed using a qualitative interpretative approach.

To ensure comparability across classes, all teachers followed the same basic unit structure (argumentation training, thematic input, fishbowl debate, written judgement task). However, teachers had autonomy in designing their thematic input, resulting in naturally occurring variation that became the focus of our analysis.

Participants

For this first exploratory and participatory phase of the project, teachers were invited through calls in newsletters of the FHNW [University of Applied Sciences and Arts Northwestern Switzerland] School of Education, publications for teachers, and personal contacts inviting them to collaborate with the research team on 'fostering argumentation and judgement competencies among students through civic education grades 8–9'. The goal was to recruit up to ten German and/or history teachers[4] with diverse experiences and backgrounds, who teach classes across various educational levels. The call resulted in a convenience sample (Saumure & Given, 2008) of six teachers who engaged in the study during the 2022–2023 school year. To ensure comparability between debates, the analysis in this paper focuses on four teachers and their classes engaging with the topic of a cashless society[5] (teachers: $n = 4$, $M_{age} = 46.0$, $M_{years\ of\ teaching} = 20.0$, female = 75 %; students: $n = 74$, $M_{age} = 14.9$, female: 37.8 %; basic requirements level: 2 classes; advanced requirements level: 2 classes). Participation in the research was voluntary, and no participants received compensation.

Participatory development of the lesson unit

The lesson unit was developed and piloted through a participatory process with the participating teachers (see Fig. 2). They participated in four on-site workshops and one optional online session. The research team provided the basic structure and most components for the unit, while teachers took the lead in developing the thematic input.

The first workshop focused on the theoretical foundations of civic education and the value of deliberation in school contexts. Between the first and second workshop, teachers identified a moderately controversial topic that would engage their students. At the second workshop, four teachers chose to focus on the same controversial issue: the cashless society. During this session, the research team introduced the guidelines for developing the thematic input and the structure of the argumentation training. An optional online session offered teachers the opportunity to seek feedback on the relevance and appropriateness of their lesson plans. During the third workshop, each teacher presented their thematic input. The final workshop provided space for in-depth reflection and discussion on teachers' experiences with implementing the entire unit.

The developed units consisted of (a) the standardised argumentation training (90 min), (b) an input session on the moderately controversial topic (90 min), (c) a fishbowl debate about the topic in class (45 min), and (d) a written judgement task (45 min; see Fig. 3 for detailed overview).

Data collection

Data collection involved video recordings of the fishbowl debates, which were subsequently transcribed using a simplified and heavily adapted version of Talk in Qualitative Social Research (TiQ; Przyborski & Wohlrab-Sahr, 2014, pp. 167–170). Additionally, written documentation of all lessons and teaching materials were collected. Background

[4] In German-speaking Switzerland, civic education is associated with history at lower secondary level (Waldis & Ziegler, 2022) and is therefore part of the integrated subject of 'Räume, Zeiten, Gesellschaft' (spaces, times, society) (D-EDK, 2016, pp. 360–361). In addition, civic education is anchored in a cross-curricular way and can become a subject of learning in any subject area (D-EDK, 2016, pp. 36–37). Additionally, teaching how to argue is part of the curriculum for German (D-EDK, 2016, pp. 74, 83–85).

[5] The teachers could freely choose a moderately controversial topic of interest to their students. Four teachers agreed on a socially relevant theme – the introduction of a cashless society – while two others independently chose a student-suggested topic related to everyday life: a sustainable school.

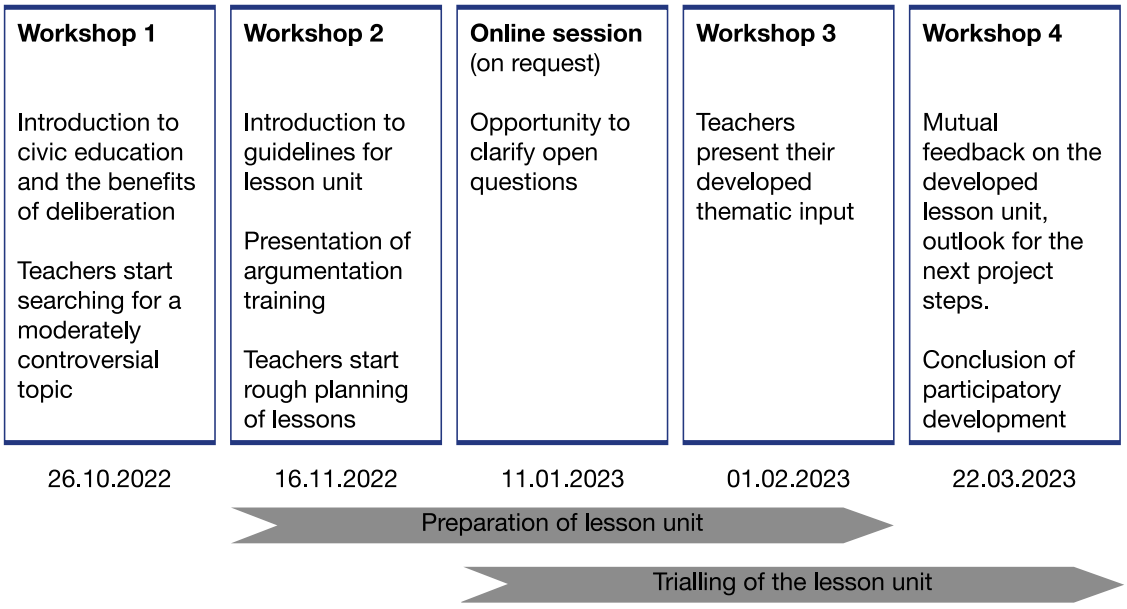

Fig. 2. Overview of the Participatory Development of the Lesson Unit.

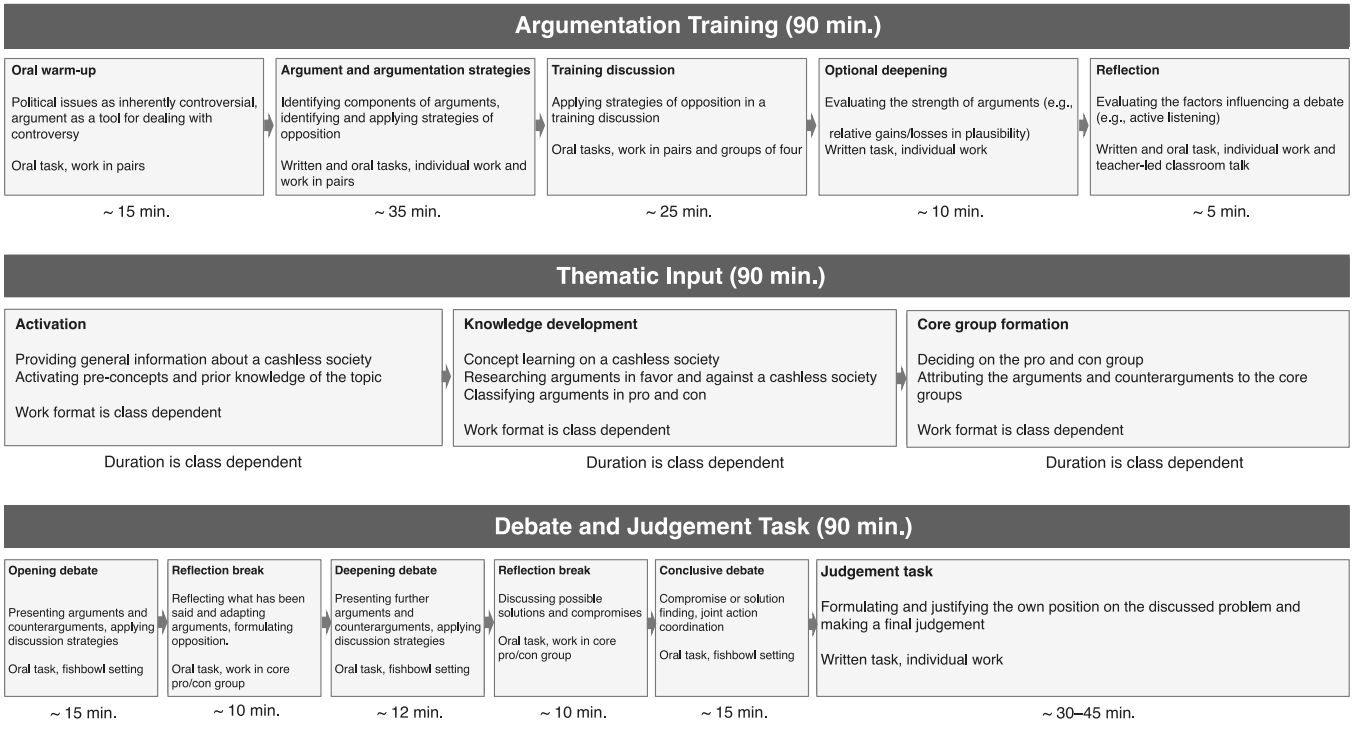

Fig. 3. Overview of the Developed Lesson Unit.

information about the classes was gathered through teacher questionnaires. Teachers conducted lessons in German – all excerpts presented in this paper have thus been translated from German into English using ChatGPT5 and DeepL Pro.

Both participating teachers and students were informed about the study's aims, the data collection methods, and the anonymisation

process. The research team collected data following FHNW School of Education data protection guidelines.[6] The participating teachers could choose among three options for consenting to data collection and storage: consent to research use, to use in the training and further education of teachers, or consent to use for the public promotion of the project and its results. Consent to research use was a prerequisite for participation. As the pupils were minors, consent was obtained from their legal guardians. The guardians could consent to the collection and use of data for research purposes and for teacher education and training purposes. Students whose guardians did not provide consent for participation left the room during the videotaped sequences. Additionally, the research team did not collect any material from these students.

During the transcription of the videotaped lessons, the names of the teachers and pupils were anonymised. Students were assigned an ID number based on their order of appearance in the video (1st student in the video = S1; 2nd student = S2; etc.). Any statement that might identify the school, students, or teacher was also anonymised during transcription. Collected materials and teaching products were scanned, and identifying information was redacted. Names were replaced with predefined IDs based on class lists. Class lists with IDs and collected data were stored separately from each other.

Data analyses

The analysis of transcribed student debates followed a four-step process using a coding scheme (see Table 1 for detailed descriptions):

1. Identification of off-topic segments: Coders identified and excluded off-topic turns from the analysis.
2. Argument structure analysis: Coders examined the argument structure based on a simplified version of Toulmin's model (1958/2003) that was used in the argumentation training. They identified theses or viewpoints and, if present, the associated justifications and conclusions.
3. Argumentative moves analysis: Coders classified the argumentative moves into four categories (initiation, co-construction, opposition and integration) based on the model of argument reappraisal (Gronostay, 2019; Leitão, 2000).
4. Transactivity evaluation: Using the coded argumentative moves, coders identified argumentative sequences and classified them according to their level of transactivity (one-sided, critical, or responsive argumentation; Gronostay, 2019).

Through *consensual coding* (Guest et al., 2012; Schmidt, 1993, pp. 61–63), the research team double-coded the debates using the software MAXQDA[7] and then reviewed them collaboratively segment by segment in pairs. Coders discussed discrepancies and agreed on solutions when possible. When no agreement could be reached, issues were discussed within the research team. The approach focused on achieving a common interpretation through structured negotiation (Hill et al., 2005), with the resolution of differences serving to improve understanding of the data (Hemmler et al., 2022; Hill et al., 2005). Because the research team systematically resolved all disagreements before finalising the coding, any intercoder agreement calculated before this collaborative resolution process would reflect only the initial disagreements rather than the quality of the final, consensually achieved coding (Hemmler et al.,

Table 1
Coding Scheme.

Category	Subcategory	Description of the speech act
Argument	Thesis	Raises a claim, makes a judgement, or gives a recommendation regarding a problem.
	Justification	Connects assumptions with the conclusion like a bridge. Can be anecdotal and consist of examples.
	Conclusion	Follows from the thesis and is supported by a justification.
Initiation		Introduces something new without referring directly to what has been said previously. Thematic shifts or linguistic markers can indicate an initiation.
Co-construction	Agreement	Agreement with a previous comment along the same lines without giving reasons
	Continuation	Completion or conclusion of a previous statement made by another person with the same line of argument.
	Elaboration	Expansion of a content aspect of a previous statement in the same line of argument, with something new being added.
Opposition	Objection	Rejection of a previous contribution from the other side of the argument without giving reasons.
	Counterargument	Criticism of a previous statement made by the other side of the argument, introducing a new aspect but not directly addressing the statement itself.
	Rebuttal	Direct criticism of a previous statement made by the other side of the argument, in which it is questioned or challenged.
	Critical question	Special form of rebuttal. The persuasiveness of a previous statement is directly questioned.
Integration		The speaker takes up criticism or a substantive aspect of the other line of argument and integrates it into their own argument by limiting its scope or offering more information to support it.
Argumentative reappraisal	One-sided argumentation	The initiation is not followed by opposition from the other line of argument. However, co-construction cannot be ruled out.
	Critical argumentation	The initiation is followed by opposition from the other line of argument, whereby the initiating line of argument does not respond to this opposition. Co-construction can occur in relation to both the initiation and the opposition.
	Responsive argumentation	The initiation is followed by opposition from the other line of argument, to which the initiating line of argument responds with opposition or integration. Co-construction can occur in relation to the initiation, the opposition to the initiation, and the opposition to the opposition.
Political/societal issue		Statement going beyond purely personal opinions or statements of fact and referring to social power relations, state structures, public order, legal norms, or collective interests.
Other statement		Statement without argumentative function but relevant to the argument in terms of content (e.g., questions for

(*continued on next page*)

[6] Richtlinien für die Sicherstellung des Datenschutzes im Umgang mit Aufzeichnungen an der Pädagogischen Hochschule der Fachhochschule Nordwestschweiz (PH FHNW) Guidelines for ensuring data protection when handling records at the FHNW School of Education at the University of Applied Sciences and Arts Northwestern Switzerland, https://www.fhnw.ch/de/die-fhnw/hochschulen/ph/rechtliche-dokumente-und-rechtserlasse/rechtserlasse-ausbildung/111-1-16_richtlinien_datenschutz_aufzeichnungen.

[7] https://www.maxqda.com/.

Table 1 (*continued*)

Category	Subcategory	Description of the speech act
		clarification and understanding, explanations, clarifications)
Off-topic		Statement without argumentative function (e.g., moderation, instruction by teacher, questions about the procedure, etc.)

Note: The description of the speech acts is based on Gronostay (2019), Leitão (2000), and Toulmin (1958/2003).

2022). For this reason, conventional intercoder agreement metrics are not reported, as they would not accurately represent the quality of the analytical process employed. Consistency was ensured through the structured negotiation process itself, documented coding criteria, anchor examples, collaborative discussions of special cases, and the documentation of those cases.

Results

We present the results in four sections: first, the result of the participatory development process; second, the structure of the arguments presented; third, the distribution of different argumentative moves in argumentative reappraisal processes; and fourth, the complexity of argumentation and the distribution of transactive and non-transactive argumentative sequences.

Overview of the developed lesson unit

Argumentation training

Building on Gronostay's (2014, D. 2019) argumentation training and incorporating scaffolding principles shown to enhance student-centred learning (Mayer, 2004; Stegmann et al., 2012), we developed a 90-minute training unit consisting of a discussion on the question of whether the voting age should be lowered to 16. After briefly discussing their own positions, students were presented with eight arguments for or against voting age 16 and had to group them into pro and con categories. This was followed by an explanation of what constitutes an argument, described as a system of interlocking statements (Toulmin, 1958/2003): a *thesis* from which a *conclusion* follows based on a *justification*. Students were additionally taught to use *examples* as a means of enhancing their justification.

After an exercise to identify the different elements of an argument, students were introduced to basic argumentation strategies:

- Formulate a counterargument: Counter the opposing side's statement with a new argument (Gronostay, 2014, p. 85; Walton, 2006, p. 27).
- Formulate a rebuttal: Criticise the opposing side's argument directly (Gronostay, 2014, p. 85).
- Ask a critical question: Use a question to systematically point out weaknesses in the opposing side's argument (Gronostay, 2014, p. 85; Walton, 2006, p. 26).
- Expand one's own argument: Respond to objections and critical questions by expanding on your own reasoning.

Students practised these strategies by first identifying the strategies used in a sample discussion. This was followed by a training discussion on the topic of CCTV surveillance in public places. Students were given cards with arguments for and against CCTV surveillance, as well as cards with argumentation strategies. Students then drew an argument card and a strategy card and had to respond to the argument using the strategy they had drawn. The training concluded with a reflection on the question 'What should be considered when arguing to ensure a good debate?', a metacognitive element shown to enhance students' argumentative capacities (Iordanou, 2022; Iordanou & Rapanta, 2021).

Thematic input session

Teachers developed the input session, varying the design according to their expertise and students' needs. To ensure comparability, this study focuses on the work of the four teachers who selected the topic of the cashless society, excluding the other two teachers from the analysis. Teachers used some of the materials supplied by the research team, including pertinent videos from SRF (Swiss television) and newspaper articles, and complemented them with their own content.[8]

Although similar materials were used, teachers employed different approaches to scaffold the lesson (see Fig. 4). Teacher 101 dedicated most of the lesson time to argument research within the previously determined pro and con groups. Teachers 102 and 104 first had the students study the material individually and then formed the pro and con groups to share the arguments they had found. Teacher 105 did not form pro and con groups in this session and did not provide the suggested material to the students, but instead spent most of the lesson working with the students' prior experiences related to the topic. Regardless of these differences, we observe the following didactic structure overall: an activation phase intended to raise students' interest in the topic, a knowledge development phase in which students gather further information, and a core group formation phase during which the debate roles are distributed and explained.

A noticeable difference between the approaches concerns the output of the lesson. Teachers 101, 102, and 105 asked students to write down their most important arguments for or against a cashless society, with Teacher 101 going a step further by having the two core groups formulate opening statements for the debate. In contrast, Class 104 included an argument-exchange phase but does not involve selecting key terms or prioritising arguments. The output of the thematic lesson is important, as it constitutes the material students will have at hand during the debate and thereby their orientation in terms of content.

Fishbowl debate and written judgement task

The third double lesson consisted of an adapted version of a fishbowl debate and a written judgement task. Unlike the input session, the research team led the development of this setting, though teacher feedback was welcomed. The aim was to adapt the basic setting so that, in the spirit of contestatory deliberation (Graff, 2022), it would guide students from a persuasive dialogue towards deliberative decision-making. Additionally, we incorporated opportunities for dialogue in small groups (Rapanta & Felton, 2022; Schuitema et al., 2011). The resulting 45-minute lesson employed a seven-phase structure with assigned groups (see Fig. 3).

The implemented fishbowl debate adhered to the method's basic structure, which comprises an inner circle where participants debate and an outer circle where remaining participants observe (Bachmann et al., 2015, p. 85; Kane, 1995). Observers identify themes and patterns or evaluate the validity and merits of arguments put forward by the inner group. In this setting, observers could participate in two ways: they could replace one of their group's debaters after small group dialogue phases or they could occupy the free chair in the inner circle during the debate. While this setting may have given the debaters a greater influence over the debate, the option to replace discussants, the unoccupied chair, and the small group phases ensured that all students had an equal opportunity to influence the debate (Knight & Johnson, 1997).

The session opened with statements from pro and con group representatives in the inner circle, with note-takers documenting arguments on visible flipcharts. This was followed by an initial debate phase where four representatives engaged in structured argumentation while peers observed from outer positions. Strategic consultation periods allowed the pro and con groups to refine their positions and develop counterarguments and/or reappraisals before potentially rotating new

[8] For an overview of the materials used, see Table 5 in the Appendix.

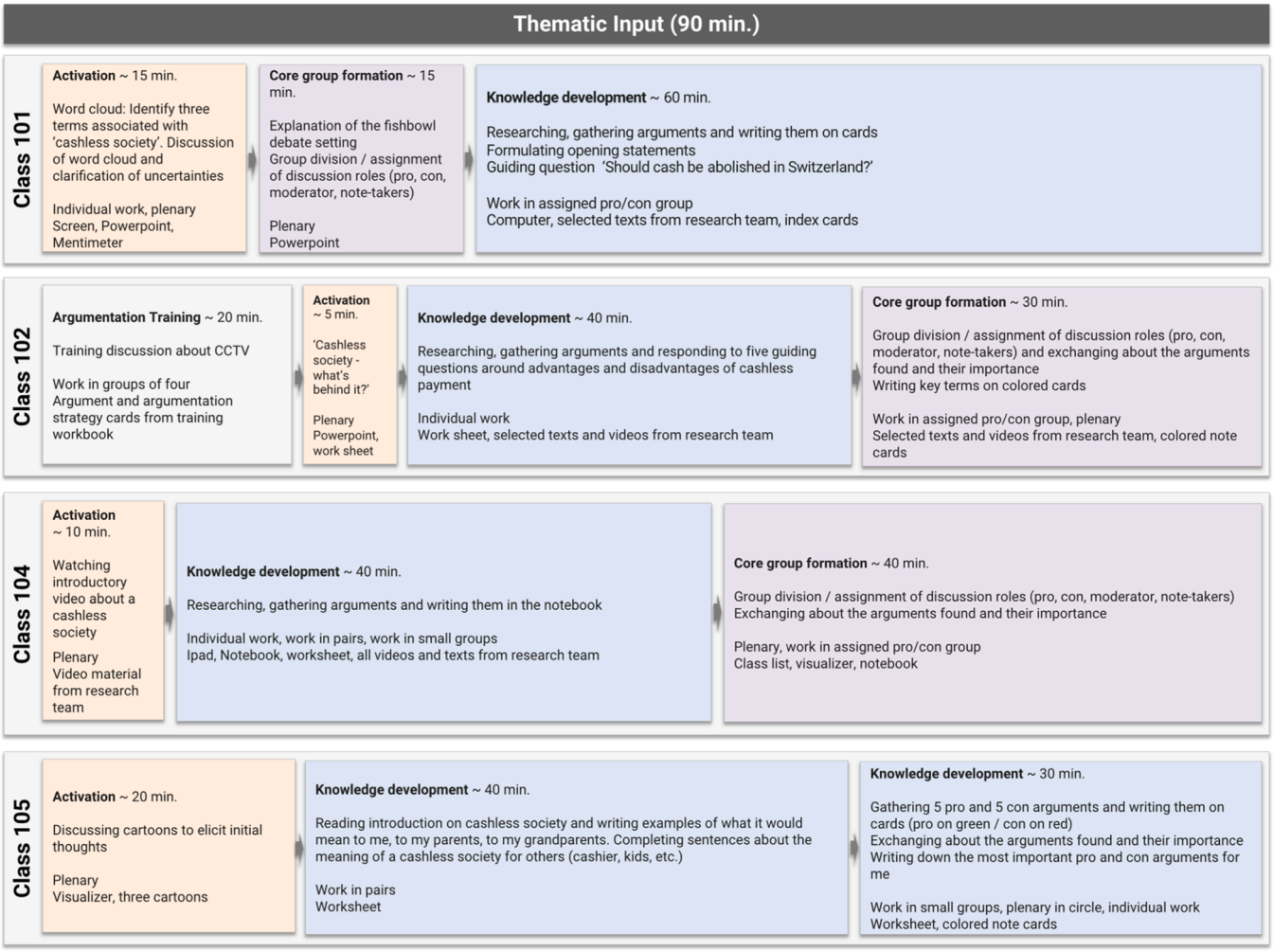

Fig. 4. Thematic Input by Class.

representatives into the fishbowl for further deliberation. These strategic consultation periods aimed at facilitating argumentation skills acquisition and fostering deliberation, are intended to encourage reflection on opposing viewpoints and the collaborative processing of arguments.

The latter phases transitioned from adversarial debate towards collaborative problem-solving – reflecting the benefits of deliberative over competitive settings (Felton et al., 2015) – with the moderator facilitating a shift towards compromise and solution-seeking. Groups first had the opportunity to retract arguments they considered now invalid or weak. Students then gathered in their respective groups for the second consultation period and discussed possible solutions that would be acceptable to them and identified compromises they would be willing to make. During this second consultation period, students were explicitly tasked to work towards a compromise and consider softening their original positions. This element was designed to make the debate more interactive and responsive. The expectation was that participants would engage with counterarguments and potentially incorporate them into their own reasoning, hence fostering a transactive dynamic (Bachmann et al., 2015; Gronostay, 2017). Representatives then presented acceptable solutions and potential alliances before voting on the issue.

After the session concluded, students were assigned a structured group reflection task, using evaluation criteria sheets, thereby promoting metacognitive awareness of argumentation processes (Iordanou, 2022). The goal was to facilitate metacognitive assessment of both the deliberative process and individual contributions to the democratic outcome. This methodology aimed to ensure systematic progression from position articulation through critical engagement to collaborative decision-making within civic education contexts.

After the debate with assigned groups, students were given the opportunity to develop their own position on the topic. They were asked to write a brief argumentative text consisting of three main components: first, an introduction to the topic; second, an overview and consideration of the most important arguments for and against a cashless society, including a justification for their selection; and finally, a detailed reasoned response to the question of whether Switzerland should become a cashless society.

Analysis of the debates

Argument structure (RQ1)

Examining the structural elements within the arguments and considering all possible configurations, a thesis is followed by an explicit justification in 22.3 % of cases, while a justification is followed by an explicit conclusion in only 9.7 % of cases (see Table 2). However, the most frequent structural pattern involves a thesis followed by another thesis, occurring in 29.6 % of configurations. When analysing the debates individually, a strong tendency towards the repeated presentation of claims is particularly evident in debates 104 and 105. In these two debates, the thesis-thesis structure appears in 36.0 % and 47.0 % of cases, respectively. This suggests that the argumentation in these classes was less explicitly reasoned, as students often did not justify their claims.

Following the argumentation training, one might have anticipated

Table 2
Absolute and Relative Frequencies of Two Consecutive Argument Structure Components by Class.

Pattern	Class 101 *n* (%)	Class 102 *n* (%)	Class 104 *n* (%)	Class 105 *n* (%)	Total *n* (%)
Thesis → Justification	80 (25.72)	39 (30.00)	18 (15.79)	31 (15.66)	168 (22.31)
Thesis → Conclusion	11 (3.54)	7 (5.38)	10 (8.77)	12 (6.06)	40 (5.31)
Thesis → Thesis	70 (22.51)	19 (14.62)	41 (35.96)	93 (46.97)	223 (29.61)
Justification → Justification	9 (2.89)	0 (0.00)	2 (1.75)	12 (6.06)	23 (3.05)
Justification → Conclusion	42 (13.50)	17 (13.08)	9 (7.89)	5 (2.53)	73 (9.69)
Justification → Thesis	46 (14.79)	23 (17.69)	13 (11.40)	28 (14.14)	110 (14.61)
Conclusion → Justification	9 (2.89)	1 (0.77)	3 (2.63)	1 (0.51)	14 (1.86)
Conclusion → Conclusion	0 (0.00)	1 (0.77)	2 (1.75)	0 (0.00)	3 (0.40)
Conclusion → Thesis	44 (14.15)	23 (17.69)	16 (14.04)	16 (8.08)	99 (13.15)
Total	311 (100.00)	130 (100.00)	114 (100.00)	198 (100.00)	753 (100.00)

Note: For the sequential analysis, a list of the identified argument elements was exported from MAXQDA to Microsoft Excel. A pattern was then created in a new column by combining each code with the subsequent one using the CONCAT function. The frequencies of these code sequences were analysed using pivot tables in Microsoft Excel.

well-structured arguments comprising a thesis, justification, and conclusion. However, when an explicit justification is presented, it is more likely to be followed by another claim than by an explicit conclusion. In fact, the justification-thesis pattern is observed 110 times, while the justification-conclusion pattern is present only 73 times. Analysing structures of three elements (as shown in Table 6), the system of thesis-justification-conclusion – which students could have interpreted as an ideal pattern for good arguments – occurs only 65 times out of 749 total structures, representing 8.7 %. By contrast, structures of three consecutive claims appear twice as frequently. Looking at each debate individually reveals noticeable differences. In debates 101 and 102, the structure of thesis-justification-conclusion appears in approximately 12.3 % and 13.2 % of sequences, respectively. In contrast, in debates 104 and 105, this structure occurs only in 5.3 % and 2.0 % of sequences.

However, this finding warrants nuanced interpretation based on a closer examination of the debates. As illustrated in the following extract from Debate 104, the connection between the thesis (in this case, the possible duration of a blackout) and the conclusion (that cash is the safest option) is sometimes left implicit. The underlying justification – that cash remains usable during power outages because it does not rely on electricity – is not always made explicit, leaving the reasoning to be inferred.

> S11: Shall we get back to the topic? You asked, eh, a question: 'What if, eh, the power went out?'. Would that be for 24 h or for a longer period of time? The power cut.
> S13: That depends, eh, on how long it takes them to fix it again.
> S11: Mhm(yes).
> S13: That's why cash is the safest option.
> S11: Mhm(yes).
> (Extract from Debate 104, Pos. 284–287; translated from German)

These findings suggest that while students were familiar with the structure of arguments following the training, they struggled to consistently apply this structure in actual debate contexts. The high frequency of thesis-thesis patterns indicates a tendency towards claim-making rather than claim-justification.

Distribution of argumentative moves (RQ2)

An analysis of the argumentative moves across the four debates reveals a clear predominance of opposition over initiation, co-construction, and integration. Of the 538 total moves identified, 342 were opposing moves – accounting for 63.5 % of all argumentative contributions. 61.1 % of these oppositional moves took the form of rebuttals, 18.4 % were critical questions (a subtype of rebuttal), 10.8 % counterarguments, and 9.6 % were objections (see Table 3). However, the high number of opposition moves is not surprising, as the debates were, at least initially, intended as persuasive dialogues. The dominance of opposition reflects the earlier observed pattern at the structural level, where claims were more frequently followed by other claims than by justifications or conclusions. This suggests that responses to a student's thesis were most often either direct opposing claims (rebuttal) or new theses criticising the other side's claim indirectly (counterargument). The high frequency of oppositional moves indicates that the debates were largely critical and perhaps even responsive in nature. By using rebuttals, students were able to actively challenge the proponent's claim and perhaps even the respondent's critique directly, leading to a responsive argumentation.

The following excerpt shows how a student uses a rebuttal to challenge the proponent's argument. S3 argues that digital-only money can hide your balance, so you might order something you can't pay for. S4 counters that a card lets you go into debt and pay anyway. S3 responds with a moral rebuttal: that is not good practice.

> S3: Uh, if now, let's say, the balance is way too small. What do you want to do then? If you order something, right? You get it and want to pay right away and your balance is too *small* and you have no money, yeah.
> S4: *I don't understand you.*
> S3: *Let's say you order something, right? Let's say somewhere in a shop, food. Then you pay later and the balance is too small.*
> S4: Yes, but with the credit card you can *go* into the minus.
> S3: *Yeah, but that's not great.*
> (Extract from Debate 105, Pos. 90–94; translated from German and Swiss German indicated by asterisks)

Overall, however, the minimal use of integration (2.8 %), indicates

Table 3
Absolute and Relative Frequencies of Discourse Modes and Argumentative Moves by Class.

Category	Class 101 *n* (%)	Class 102 *n* (%)	Class 104 *n* (%)	Class 105 *n* (%)	Total *n* (%)
Initiation	59 (24.69)	16 (17.58)	29 (38.67)	21 (15.79)	125 (23.23)
Co-construction	31 (12.97)	4 (4.40)	8 (10.67)	13 (9.77)	56 (10.41)
Agreement	12 (5.02)	1 (1.10)	1 (1.33)	2 (1.50)	16 (2.97)
Continuation	9 (3.77)	1 (1.10)	5 (6.67)	6 (4.51)	21 (3.90)
Elaboration	10 (4.18)	2 (2.20)	2 (2.67)	5 (3.76)	19 (3.53)
Opposition	140 (58.58)	70 (76.92)	37 (49.33)	95 (71.43)	342 (63.57)
Objection	16 (6.69)	2 (2.20)	7 (9.33)	8 (6.02)	33 (6.13)
Counterargument	7 (2.93)	7 (7.69)	9 (12.00)	14 (10.53)	37 (6.88)
Rebuttal	82 (34.31)	45 (49.45)	19 (25.33)	63 (47.37)	209 (38.85)
Critical question	35 (14.64)	16 (17.58)	2 (2.67)	10 (7.52)	63 (11.71)
Integration	9 (3.77)	1 (1.10)	1 (1.33)	4 (3.01)	15 (2.79)
Total	239 (100.00)	91 (100.00)	75 (100.00)	133 (100.00)	538 (100.00)

Note: Subcategories are indented under their respective main categories. Co-construction includes agreement, continuation, and elaboration. Opposition includes objection, counterargument, rebuttal, and critical question.

rare attempts to incorporate or build upon the respondent's points within their own argumentative framework. This pattern provides relevant context for understanding the transactivity levels reported in RQ3, as integration is a marker of responsive argumentation.

Argumentation complexity and transactivity (RQ3)

The complexity of argumentation was assessed by analysing the number of argumentative reappraisal sequences, which in turn served as an indicator of each debate's level of transactivity. As shown in Table 4, one-sided argumentation is the most prevalent pattern (38.3 %). Additionally, the distribution between critical (29.7 %) and responsive (32.0 %) argumentation is relatively balanced.

Notably, the four debates vary significantly in their levels of argumentative reappraisal. Debate 101 appears to be the most transactive, with 40.0 % of its sequences categorised as responsive. Debate 102, while predominantly critical (50.0 %), also shows a significant share of responsive sequences (31.3 %). Similarly, in Debate 105, half of the sequences are critical, but a substantial portion (35.0 %) remains one-sided, indicating that claims were frequently left unchallenged. Debate 104 demonstrates the lowest level of transactivity, with 56.3 % of its argumentation being one-sided – suggesting minimal engagement with opposing viewpoints.

These figures require nuanced interpretation: they capture transactivity, not content quality. As the next excerpt from Debate 102 shows, critical argumentation can be lively and substantive, but without the proponent's reply to the critique, it falls short of a responsive exchange. Here, the sequence would become responsive if S8 either challenged S2's point or incorporated it, e.g., by arguing that memorising a card code could be a healthy challenge for older people.

> S8: Think, for example, of the children. Now imagine a small child, who is about eight, nine or so, goes into the shop with a card. And that would also be rather strange and so on. For us, too, for example for the seniors it is also important, the older generation, to keep it, and also for the children. Because the children should rather start with cash instead of with the card, because it is also, for example, difficult/ difficult for a child to remember the codes and all that.
> S2: I partly agree with you there. But you also have to see that when they are later adults, they also have to be able to handle that.
> (Extract from Debate 102, Pos. 126–127; translated from German)

The code trends visualisation – a MAXQDA feature showing the temporal distribution of codes – of the three types of argumentative reappraisal (see Fig. 5) further illustrates the variation in argumentative complexity across the debates. While debates 101 and 104 feature a similar number of one-sided argumentations, debate 101 includes nearly twice as many argumentative sequences, mitigating the impact of its one-sided contributions and enhancing the overall complexity of the discourse.

Fig. 6 illustrates the sequence of argumentative segments in each debate. As expected, all debates begin with one-sided arguments, reflecting the format that prompts students to open with prepared

Table 4
Absolute and Relative Frequencies of Argumentative Reappraisal by Class.

Argumentative reappraisal type	Class 101 *n* (%)	Class 102 *n* (%)	Class 104 *n* (%)	Class 105 *n* (%)	Totaln (%)
One-sided argumentation	21 (35.00)	3 (18.75)	18 (56.25)	7 (35.00)	49 (38.28)
Critical argumentation	15 (25.00)	8 (50.00)	5 (15.63)	10 (50.00)	38 (29.69)
Responsive argumentation	24 (40.00)	5 (31.25)	9 (28.13)	3 (15.00)	41 (32.03)
Total	60 (100.00)	16 (100.00)	32 (100.00)	20 (100.00)	128 (100.00)

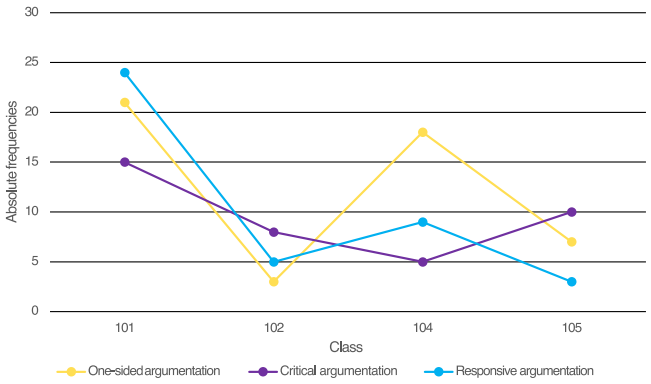

Fig. 5. Code trends of argumentative reappraisal in the four debates by class.

statements. Notably, the visualisation adjusts segment length proportionally to their duration within the debate. As a result, critical and especially responsive arguments occupy more visual space since they span multiple turns, unlike the briefer one-sided arguments.

Setting aside segment length, the structural patterns across the four debates reveal interesting contrasts. Debate 101 displays a balanced argumentative flow, with a mix of more and less interactive segments and minimal off-topic segments, indicated by small blank spaces. In contrast, Debates 102 and 105 each feature noticeable off-topic segments, as the large white gaps show, corresponding to a mid-debate strategic period when students returned to their pro/con groups to explore potential agreements. Debate 104 stands out for its fragmented structure, with frequent and extended off-topic segments throughout. This, combined with its high proportion of one-sided arguments (56.3 %), suggests that the aspects of the topic discussed in this debate failed to foster sustained or in-depth dialogue.

Discussion

The cognitive challenge of argument formation

At the micro level, the arguments presented in the debates appear fragmented. Students often present claims more readily than they provide justifications or conclusions for them. As shown in Table 2, only 22.3 % of statements were followed by explicit justification, with considerable variation across classes (from 15.7 % in Class 105 to 30.0 % in Class 102).

The fragmentation reflects competing expectations. Well-structured arguments might be expected because the argumentation training presented an argument – although briefly, in about 20 min – as a system of interconnected statements: thesis, justification, and conclusion. However, fragmentation was also to be expected (Gronostay, 2017; Lugin-bühl & Müller-Feldmeth, 2022) and does not automatically imply poor arguments. Speakers in natural language tend to avoid explicitly formulating argument elements that are self-evident, considered common knowledge, or deemed well-known in the specific discussion context (Anderson et al., 1997). Speakers may also omit explicit justifications to shift the burden of proof onto listeners (Macagno & Damele, 2013).

An additional explanation for the high number of unsupported claims is that students may present a series of assertions without intending to engage with their interlocutors directly. The reasons for this are varied. Some students may have a misconception of persuasive dialogue, understanding it more as a contest of opinions rather than a reasoned exchange. Alternatively, the reasons could be more practical: students might not fully grasp their opponent's arguments and therefore struggle to challenge them effectively. When a thesis is presented without supporting justification, listeners arguably find it more difficult to understand and critically assess the argument. As a result, listeners

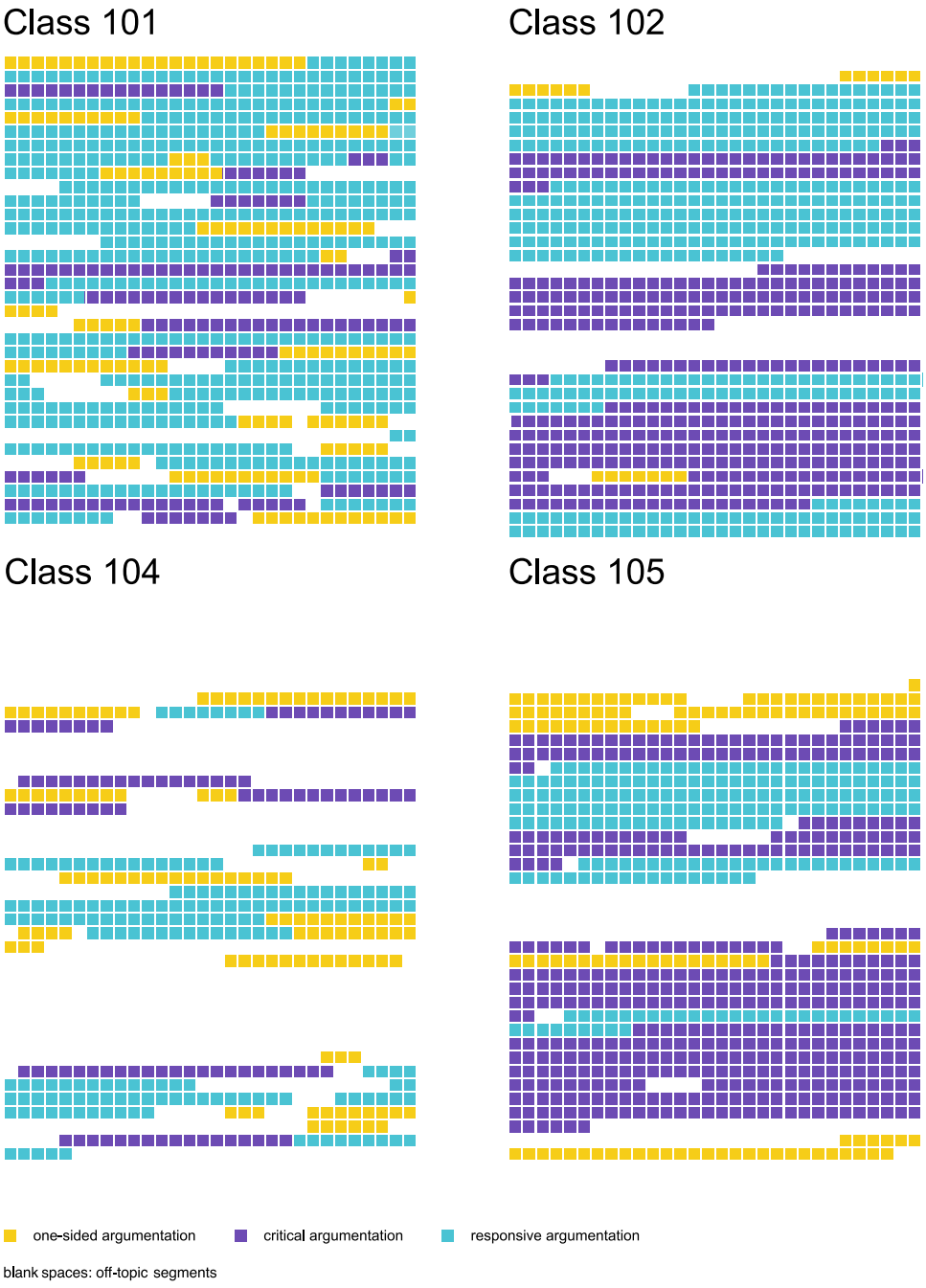

Fig. 6. Document portrait of the four debates for the codes of argumentative reappraisal.
Note: MAXQDA allocates a standardised number of squares to the distribution of codes. This means that each debate is represented by the same number of squares, regardless of its actual length. Yellow = one-sided argumentation, purple = critical argumentation, blue = responsive argumentation, blank spaces = off-topic segments. Overlapping and parallel codes are not displayed.

are left either to infer missing reasoning and respond accordingly, or to counter with general objections that do little to advance a meaningful, transactive dialogue.

Finally, the observed differences between the classes may be attributable to the output generated during the thematic lesson. In Class 101, this output consisted of structured index cards for pro and con arguments (mirroring the material used in the argumentation training) as well as opening statements, whereas students in Class 104 concluded the thematic input with a simple, unordered list of arguments in their notebooks. This may have made it more difficult for students in Class 104 to organise their thoughts and structure their arguments during the debate.

This pattern has implications for argumentation training design. Our findings suggest that the quality of thematic preparation – how teachers scaffold content engagement – may be crucial. Classes 101 and 102, which produced more structured thematic outputs (argument cards and opening statements), showed higher rates of justified claims (25.7 % and 30.0 % respectively) compared to Classes 104 and 105 (15.8 % and 15.7 %). This pattern suggests a potential mechanism: structured thematic preparation may provide students with clearer cognitive schemas that facilitate on-the-fly argument construction during debates.

However, we must be cautious about causal claims. These are naturally occurring variations in a participatory development process, and we cannot rule out alternative explanations such as class

composition, prior debating experience, or teacher facilitation styles. This underscores the need for controlled quasi-experimental designs in future research, examining systematically how different forms of thematic scaffolding interact with argumentation training to shape discussion quality (on scaffolding effectiveness, see Mayer, 2004; Stegmann et al., 2012).

Fostering transactivity through controversy

In addition to the lack of explicitly justified claims, we also noted an absence of conclusions, which may stem from the cognitive difficulty involved in articulating them. Presenting a claim is relatively straightforward – especially when students have prepared arguments in advance – as is providing justifications with examples. However, formulating a conclusion is more demanding, particularly in high-pressure environments like fishbowl debates. In such formats, where a small group debates at the centre while others observe, participants may feel pressured to assert dominance or protect their group's stance. This pressure can lead to a rapid succession of claims, used almost defensively, rather than to the careful construction of complete arguments. Repeated argumentation training in similar settings could help reduce this pressure and improve students' ability to conclude their arguments effectively.

Additionally, choosing a fishbowl debate could result in a methodological effect. Students may view fishbowl debates as a 'competition of opinion', potentially resulting in the debate becoming locked in an overly simplistic persuasive dialogue. In this context, while participants may make implicit concessions, openly retracting a position is generally seen as a poor rhetorical move (Felton et al., 2009, p. 422; Gronostay, 2016, p. 44). The aim therefore remains to persuade others to accept a contested point of view rather than to find some sort of consensus. Consequently, debaters are likely to challenge opposing arguments directly, seeking to undermine their validity. Unsurprisingly, in the four debates analysed, oppositional strategies substantially more common (63.5 % of all moves) than collaborative or integrative ones. Participants primarily responded with critical questions and rebuttals, adopting a defensive posture towards opposing views.

These findings align with those of Gronostay (2017), who also observed that students – regardless of whether they had received argumentation training – tended to favour oppositional moves over collaborative or integrative ones. However, our study diverges from hers in the nature of those oppositional strategies. While Gronostay's participants more often employed indirect criticism through counterarguments, this study reveals a much higher incidence of rebuttals and critical questions – forms of direct, reasoned critique. Nevertheless, it is important to emphasise that the debates were generally more critically reactive than overtly confrontational. This is evident in the predominance of rebuttals over direct, unsubstantiated objections. This pattern underscores the co-constructive nature of oral argumentation and highlights the potential of dialectic transactivity, where opposition plays a central role in learning (Vogel et al., 2016, pp. 479–480), thereby emphasising the value of fostering a transactive dynamic in classroom debates.

Our findings on oppositional moves contribute to ongoing debates about competitive versus deliberative educational formats (e.g., Felton et al., 2015). The fishbowl format employed here with contestatory opening but deliberative closing resulted in high levels of transactive opposition (rebuttals constituting 61.1 % of oppositional moves). This suggests that hybrid formats in the vein of Graff's (2022) 'contestatory deliberative' setting may successfully channel students' natural inclination to disagree into reasoned critique rather than mere assertion.

However, the variation in transactivity levels across classes (from 28.1 % responsive argumentation in Class 104 to 40.0 % in Class 101, see Table 4) indicates that format alone is insufficient. Even with identical debate structures, Classes 104 and 105 showed considerably more one-sided argumentation (56.3 % and 35.0 % respectively) than Classes 101 and 102 (35.0 % and 18.8 %). This pattern mirrors the variation in argument structure noted earlier and reinforces the hypothesis that thematic scaffolding quality mediates the effectiveness of argumentation training.

A dual focus necessary in responsive argumentation

The analysis of the four debates supports Kuhn and Udell's (2007) observation that incorporating critique into one's own argumentation is a complex coordination task, demanding a continuous dual focus. This dialogical quality (Koschmann, 1999) involves both reflecting on how the critique relates to one's initial position and reworking that position in light of the critique. The construction of such transactive speech acts require a high degree of cognitive sophistication, which is rarely achieved without sustained practice. This underlines the importance of continued training in argumentation, particularly in cognitively demanding formats such as the fishbowl debate.

In a contestatory deliberative debate format like the one implemented here, participants should move seamlessly between various forms of dialogue. Initially, the structure encourages the presentation of pre-prepared arguments, which leads to a concentration of one-sided argumentation at the outset of each debate. Positioned in opposing pro and con groups, participants sit facing each other and, in the first round, articulate arguments in support of their assigned stance. This adversarial setup follows established recommendations and emphasises disagreement and challenge to expose the controversial nature of the topic (Graff, 2022, p. 622) – namely, the benefits and disadvantages of a cashless society.

The two strategic small-group discussion periods were designed to make the debate more interactive and responsive, with the goal of participants engaging collectively with opposing arguments, consider their implication for their own position, and possibly incorporate counterarguments into their own reasoning. During the second break, participants were specifically encouraged to work towards a compromise. We could thus expect more dialogic transactive speech acts at the end of the debate. However, this shift in dynamic does not emerge in the four debates analysed. While Debate 101, in particular, showcases the potential of the fishbowl format to support high-quality discussions characterised by frequent critical and responsive argumentations, no clear change in interaction patterns is observed following the two group discussions. A more in-depth analysis of the small-group discussions is needed to assess what students may have learned during these exchanges, especially given that existing literature suggests argumentation skills can develop through such interactions (Rapanta & Felton, 2022; Schuitema et al., 2011). As Leitão (2000) points out, complete shifts in position are unlikely in highly polarised debate contexts. The formulation of a genuine compromise proves to be a complex task – one that likely requires not only more training and a more gradual introduction to deliberative principles, but more time as well.

These observations align with research emphasising sustained practice (Iordanou & Rapanta, 2021). They emphasise that argumentative competence emerges through sustained participation in argumentative practices rather than through one-off interventions. The relative absence of integrative moves (2.8 % overall) and the limited shift towards deliberative engagement in later debate phases suggest that a 90-minute training, while valuable, provides insufficient scaffolding for students to manage the dual cognitive tasks of maintaining their position while genuinely engaging with opposition.

As students demonstrated capacity for reasoned opposition (high rebuttal rates), but struggled with the more cognitively demanding tasks of integration and synthesis, future iterations of our approach might benefit from incorporating adaptive fading (Noroozi et al., 2018; Schwaighofer et al., 2017). Perhaps beginning with heavily scaffolded integration tasks before progressing to open debates could prove beneficial.

Conclusion

Formulating structured and comprehensible arguments is a complex skill that requires repeated practice. The four fishbowl debates analysed in this study clearly demonstrate the intricate nature of oral argumentation. Participants are not only required to construct coherent arguments that represent their own stance, but also to actively challenge opposing viewpoints within a deliberative and adversarial context. Furthermore, when their arguments are criticised, they must interpret the critique in light of their own position and incorporate it into their response – either to counter the critique effectively or at least to prevent their argument from being undermined.

The analysis of the four debates on a cashless society reveals variation in levels of transactivity. Despite identical argumentation training and a consistent debate format, variations in thematic input – possibly along with factors such as prior debating experience or classroom cohesion – may have contributed to distinctly different discussion dynamics. Some debates are largely fragmented, featuring minimal critical engagement or responsive interaction, while others display extended, collaboratively constructed argumentative sequences rich in integrative elements. The standardisation of the lesson unit in the second phase of the project, combined with the evaluation of contextual factors such as students' prior education and classroom social dynamics, is intended to provide deeper insights into the factors that promote or hinder transactive debating.

Our exploratory study shows considerable variation in discussion quality across classrooms receiving identical argumentation training. This emphasises that thematic scaffolding – how teachers prepare students in terms of content for debates – plays an important role alongside training in argumentative strategies. Additionally, we observed that students are capable of reasoned opposition (evidenced by high rebuttal rates) but struggle with the cognitively demanding task of integrating opposing perspectives into their own reasoning, thereby indicating areas where further pedagogical support is needed.

Building on these findings, our analysis supports the hypothesis that fostering argumentation literacy in civic education contexts requires a two-pronged approach: explicit training in argumentative strategies (Gronostay, 2017) combined with careful scaffolding of thematic content. Teachers should not assume that generic argumentation skills automatically transfer to substantive political discussions. Rather, students need structured support in both how to argue and what to argue about. The variation we observed across classes despite identical training underscores this conclusion.

However, several limitations merit acknowledgement. First, as an exploratory study with naturally occurring variation in teacher practices, causal inferences or generalisations cannot be drawn about which specific aspects of thematic scaffolding led to better outcomes. The second phase of our project, currently underway, employs a more controlled experimental design to address this limitation. Second, our analysis focused exclusively on oral debates. Incorporating the written judgement task and analysing the interconnection between oral and written argumentation is therefore warranted.

Finally, we note that the landscape of argumentation instruction is rapidly evolving. The emergence of generative artificial intelligence tools introduces both opportunities and challenges for argumentation literacy development (e.g., Abdelghani et al., 2023). On one hand, AI tools can provide personalised scaffolding, model effective argumentative strategies, and offer immediate feedback on argument quality – potentially addressing some of the limitations identified in this study. Students might use AI to explore counterarguments, refine their reasoning, or receive structured support for integration tasks. On the other hand, the ease with which AI can generate arguments raises concerns about students outsourcing cognitive work rather than developing their own argumentative capacities (Gerlich, 2025). Given the central role of thematic scaffolding identified in our study, future research must examine how AI tools can enhance rather than replace authentic argumentative engagement, ensuring that technological affordances support rather than undermine the development of citizens capable of independent critical judgement.

Declaration of generative AI and AI-assisted technologies in the writing process

During the preparation of this work the authors used ChatGPT 5 and Claude Sonnet 4.5 to improve the readability and language. After using this tool, the authors reviewed and edited the content as needed and take full responsibility for the content of the published article.

Funding

This work was supported by the Swiss National Science Foundation (SNSF) [grant number 204980, 2021].

CRediT authorship contribution statement

Liliane Wenger: Writing – original draft, Visualization, Methodology, Investigation, Conceptualization. **Manuel S. Hubacher:** Writing – original draft, Visualization, Methodology, Investigation, Conceptualization. **Açelya Aydin:** Writing – review & editing, Methodology, Investigation, Conceptualization. **Monika Waldis:** Writing – review & editing, Visualization, Supervision, Project administration, Methodology, Investigation, Funding acquisition.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Acknowledgements

We wish to express our gratitude to the participating teachers and their students. Without their support, engagement, and participation, this study would not have been possible. We are also grateful to Julia Thyroff and Jonas Schobinger for their thoughtful comments on earlier drafts, and to the anonymous reviewers for their constructive feedback.

Appendix

Table 5
Suggested material for the thematic input.

Media type	Title	Autor(s)	Publisher	Date
Discussion paper	Wer braucht den noch Bargeld?	Adrian Schatzmann	Schweizerische Bankiervereinigung (SBVg)	10.2019
Newspaper article	Das bargeldlose Leben erscheint in Zeiten derEnergiekrise plötzlich als Risiko – denn ohne Stromfunktioniert nur noch Bares	Daniel Imwinkelried, Rudolf Hermann, Thomas Fuster	NZZ	06.10.2022
Newspaper article	Bundesrat will Forderung von Massnahmen - Skeptikern in Verfassung schreiben	Konrad Staehelin	Tagesanzeiger	18.05.2023
Newspaper article	Land ohne Bargeld	Christine Mattauch	Handelsverband Deutschland (HDE)	06.07.2022
Newspaper article	Eine Welt ohne Bargeld - Kein Bargeld mehr in Schweden	unknown	WirtschaftsWerkstatt W2	unknown
Video	Bezahlen: Vom Bargeld zum Bitcoin (Folge 2)	Gian-Marco Maissen	SRF Wirtschaft und Gesellschaft	01.10.2022
Article and videos	Noten in Nöten: Sind die Tage des Bargelds gezählt?	Raphael Zehnder	SRF Kultur	08.01.2020
Video	Ohne Bargeld - Wie effektiv ist das schwedische Cash-Free-System?	Galileo	ProSieben	03.08.2018
Video	Wie sieht eine bargeldlose Gesellschaft aus?	SRF Nuovo	SRF Nuovo	27.02.2018
Video	FOKUS: Chancen und Risiken der bargeldlosen Gesellschaft	SRF 10vor10	SRF 10vor10	10.02.2016

Table 6
Absolute and relative frequencies of three consecutive argument structure components by class.

Pattern	Class 101 *n* (%)	Class 102 *n* (%)	Class 104 *n* (%)	Class 105 *n* (%)	Total *n* (%)
Thesis → Justification → Justification	8 (2.58)	0 (0.00)	1 (0.88)	3 (1.52)	12 (1.60)
Thesis → Justification → Conclusion	38 (12.26)	17 (13.18)	6 (5.31)	4 (2.03)	65 (8.68)
Thesis → Justification → Thesis	33 (10.65)	22 (17.05)	11 (9.73)	24 (12.18)	90 (12.02)
Thesis → Conclusion → Justification	2 (0.65)	0 (0.00)	1 (0.88)	0 (0.00)	3 (0.40)
Thesis → Conclusion → Conclusion	0 (0.00)	1 (0.78)	1 (0.88)	0 (0.00)	2 (0.27)
Thesis → Conclusion → Thesis	9 (2.90)	6 (4.65)	8 (7.08)	12 (6.09)	35 (4.67)
Thesis → Thesis → Justification	32 (10.32)	14 (10.85)	10 (8.85)	20 (10.15)	76 (10.15)
Thesis → Thesis → Conclusion	3 (0.97)	1 (0.78)	6 (5.31)	9 (4.57)	19 (2.54)
Thesis → Thesis → Thesis	35 (11.29)	4 (3.10)	24 (21.24)	64 (32.49)	127 (16.96)
Justification → Justification → Justification	1 (0.32)	0 (0.00)	0 (0.00)	7 (3.55)	8 (1.07)
Justification → Justification → Conclusion	2 (0.65)	0 (0.00)	2 (1.77)	1 (0.51)	5 (0.67)
Justification → Justification → Thesis	6 (1.94)	0 (0.00)	0 (0.00)	4 (2.03)	10 (1.34)
Justification → Conclusion → Justification	7 (2.26)	1 (0.78)	2 (1.77)	1 (0.51)	11 (1.47)
Justification → Conclusion → Conclusion	0 (0.00)	0 (0.00)	1 (0.88)	0 (0.00)	1 (0.13)
Justification → Conclusion → Thesis	35 (11.29)	16 (12.40)	6 (5.31)	4 (2.03)	61 (8.14)
Justification → Thesis → Justification	25 (8.06)	12 (9.30)	4 (3.54)	8 (4.06)	49 (6.54)
Justification → Thesis → Conclusion	6 (1.94)	4 (3.10)	1 (0.88)	2 (1.02)	13 (1.74)
Justification → Thesis → Thesis	15 (4.84)	7 (5.43)	8 (7.08)	17 (8.63)	47 (6.28)
Conclusion → Justification → Justification	0 (0.00)	0 (0.00)	1 (0.88)	1 (0.51)	2 (0.27)
Conclusion → Justification → Conclusion	2 (0.65)	0 (0.00)	0 (0.00)	0 (0.00)	2 (0.27)
Conclusion → Justification → Thesis	7 (2.26)	1 (0.78)	2 (1.77)	0 (0.00)	10 (1.34)
Conclusion → Conclusion → Thesis	0 (0.00)	1 (0.78)	2 (1.77)	0 (0.00)	3 (0.40)
Conclusion → Thesis → Justification	23 (7.42)	12 (9.30)	4 (3.54)	3 (1.52)	42 (5.61)
Conclusion → Thesis → Conclusion	2 (0.65)	2 (1.55)	3 (2.65)	1 (0.51)	8 (1.07)
Conclusion → Thesis → Thesis	19 (6.13)	8 (6.20)	9 (7.96)	12 (6.09)	48 (6.41)
Total	310 (100.00)	129 (100.00)	113 (100.00)	197 (100.00)	749 (100.00)

References

Abdelghani, R., Wang, Y.-H., Yuan, X., Wang, T., Lucas, P., Sauzéon, H., & Oudeyer, P.-Y. (2023). GPT-3-driven pedagogical agents to train children's curious question-asking skills. *International Journal of Artificial Intelligence in Education*. https://doi.org/10.1007/s40593-023-00340-7

Acar, O., Turkmen, L., & Roychoudhury, A. (2010). Student difficulties in socio-scientific argumentation and decision-making research findings: Crossing the borders of two research lines. *International Journal of Science Education, 32*(9), 1191–1206. https://doi.org/10.1080/09500690902991805

Albe, V. (2008). Students' positions and considerations of scientific evidence about a controversial socioscientific issue. *Science & Education, 17*(8), 805–827. https://doi.org/10.1007/s11191-007-9086-6

Alscher, P., Ludewig, U., & McElvany, N. (2022). Civic education, teaching quality and students' willingness to participate in political and civic life: Political interest and knowledge as mediators. *Journal of Youth and Adolescence, 51*(10), 1886–1900. https://doi.org/10.1007/s10964-022-01639-9

Anderson, R. C., Chinn, C., Chang, J., Waggoner, M., & Yi, H. (1997). On the logical integrity of children's arguments. *Cognition and Instruction, 15*(2), 135–167. https://doi.org/10.1207/s1532690xci1502_1

Asterhan, C. S. C., & Schwarz, B. B. (2007). The effects of monological and dialogical argumentation on concept learning in evolutionary theory. *Journal of Educational Psychology, 99*(3), 626–639. https://doi.org/10.1037/0022-0663.99.3.626

Avery, P. G., Levy, S. A., & Simmons, A. M. M. (2013). Deliberating controversial public issues as part of civic education. *The Social Studies, 104*(3), 105–114. https://doi.org/10.1080/00377996.2012.691571

Bachmann, D., Blaesi, N., & Bissig, S. (2015). *Methodenstark: Ideensammlung für vielfältige Aus- und Weiterbildung*. Rex.

Bachmann, D., Blaesi, N., & Bissig, S. (2015). Strong in methods: Collection of ideas for diverse education and training. *Methodenstark: Ideensammlung für vielfältige Aus- und Weiterbildung*. Rex.

Bächtiger, A. (2011). *Contestatory deliberation* [Paper]. In *Epistemic Democracy Conference*. Yale University.

Bächtiger, A., Dryzek, J. S., Mansbridge, J., & Warren, M. (2018). Deliberative Democracy: An Introduction. In A. Bächtiger, J. S. Dryzek, J. Mansbridge, &

M. Warren (Eds.), *The oxford handbook of deliberative democracy* (pp. 1–32). Oxford University Press. https://doi.org/10.1093/oxfordhb/9780198747369.013.50.
Cai, R., Wu, C., & Jin, H. (2025). On the efficiency of adaptive collaborative scripts in learning: A systematic literature review on fading-out scripts, adaptive scripts, and self-adaptive scripts. *Interactive Learning Environments, 33*(2), 944–968. https://doi.org/10.1080/10494820.2024.2371931
Chen, Y.-C., Park, S., & Hand, B. (2016). Examining the Use of Talk and Writing for Students' Development of Scientific Conceptual Knowledge Through Constructing and Critiquing Arguments. *Cognition and Instruction, 34*(2), 100–147. https://doi.org/10.1080/07370008.2016.1145120
Clarà, M. (2023). Conceptually driven inquiry: Addressing the tension between dialogicity and teleology in dialogic approaches to classroom talk. *Educational Review, 75*(3), 468–487. https://doi.org/10.1080/00131911.2021.1923462
Cohen, J. (2005). Deliberation and democratic legitimacy. In D. Matravers, & J. Pike (Eds.), *Debates in contemporary political philosophy* (pp. 342–360). Routledge. Original work published 1989.
Crowell, A., & Kuhn, D. (2014). Developing dialogic argumentation skills: A 3-year intervention study. *Journal of Cognition and Development, 15*(2), 363–381. https://doi.org/10.1080/15248372.2012.725187
Curato, N., Niemeyer, S., & Dryzek, J. S. (2013). Appreciative and contestatory inquiry in deliberative forums: Can group hugs be dangerous? *Critical Policy Studies, 7*(1), 1–17. https://doi.org/10.1080/19460171.2012.758595
D-EDK. (2016). *Lehrplan 21. Gesamtausgabe*. Deutschschweizer Erziehungsdirektoren-Konferenz. https://v-ef.lehrplan.ch/container/V_EF_DE_Gesamtausgabe.pdf.
Detjen, J., Massing, P., Richter, D., & Weisseno, G. (2012). *Politikkompetenz – ein Modell [Political competence – A model]*. Springer VS. https://doi.org/10.1007/978-3-658-00785-0
Dewey, J. (1996). *Die Öffentlichkeit und ihre Probleme (W.-D. Junghanns, Trans.)*. Philo.
Drerup, J. (2021). *Konstruktiv streiten lernen. Kontroverse Themen im Unterricht*. Reclam.
Dryzek, J. S., & Niemeyer, S. (2010). Pluralism and meta-consensus. In J. S. Dryzek (Ed.), *Foundations and frontiers of deliberative governance* (pp. 85–116). Oxford University Press. https://doi.org/10.1093/acprof:oSo/9780199562947.003.0005.
Erduran, S., Simon, S., & Osborne, J. (2004). TAPping into argumentation: Developments in the application of Toulmin's Argument Pattern for studying science discourse. *Science Education, 88*, 915–933.
Felton, M., Garcia-Mila, M., & Gilabert, S. (2009). Deliberation versus dispute: The impact of argumentative discourse goals on learning and reasoning in the science classroom. *Informal Logic, 29*(4), 417–446. https://doi.org/10.22329/il.v29i4.2907
Felton, M., Garcia-Mila, M., Villarroel, C., & Gilabert, S. (2015). Arguing collaboratively: Argumentative discourse types and their potential for knowledge building. *British Journal of Educational Psychology, 85*(3), 372–386. https://doi.org/10.1111/bjep.12078
Garcia-Mila, M., Miralda-Banda, A., Luna, J., Remesal, A., Castells, N., & Gilabert, S. (2021). Change in classroom dialogicity to promote cultural literacy across educational levels. *Sustainability, 13*(11), 6410. https://doi.org/10.3390/su13116410
Gerlich, M. (2025). AI tools in society: Impacts on cognitive offloading and the future of critical thinking. *Societies, 15*(1), 6. https://doi.org/10.3390/soc15010006
Goll, T. (2012). Sprachhandeln: Verhandeln, argumentieren, Überzeugen – eine vernachlässigte Kompetenz des Politikunterrichts? In G. Weisseno, & H. Buchstein (Eds.), *Politisch Handeln: Modelle, Möglichkeiten, Kompetenzen* (pp. 193–209). Bundeszentrale für politische Bildung.
Graff, J. (2022). Debating as a deliberative instrument in educational practice. *Studies in Philosophy and Education, 41*(6), 613–633. https://doi.org/10.1007/s11217-022-09844-6
Groarke, L. (2021). Informal Logic. In E. N. Zalta (Ed.), *The stanford encyclopedia of philosophy (Fall 2021)*. Metaphysics Research Lab, Stanford University. https://plato.stanford.edu/archives/fall2021/entries/logic-informal/.
Gronostay, D. (2014). 'Ich bin dagegen, weil…' – Argumentative Lehr-Lernprozesse im Politikunterricht ['I disagree because…' – Argumentative teaching-learning processes in political education]. In Manzel, S. (Ed.), Politisch mündig werden: Politikkompetenz in der Schule aufbauen und diagnostizieren (pp. 35–47). Budrich.
Gronostay, D. (2016). Argument, counterargument, and integration? Patterns of argument reappraisal in controversial classroom discussions. *Journal of Social Science Education, 15*(2), 42–56. https://doi.org/10.4119/jsse-792
Gronostay, D. (2017). Enhancing the quality of controversial discussions via argumentation training: A quasi-experimental study in civic education classrooms. *Bildung und Erziehung, 70*(1), 75–90. https://doi.org/10.7788/bue-2017-0107
Gronostay, D. (2019). *Argumentative Lehr-Lern-Prozesse im Politikunterricht: eine Videostudie [Argumentative teaching-learning processes in political education: A video study]*. Springer VS. https://doi.org/10.1007/978-3-658-25671-5
Grundler, E. (2011). Kompetent argumentieren. Ein gesprächsanalytisch fundiertes Modell [Competent arguing: A conversation-analytically grounded model]. Stauffenburg.
Guest, G., MacQueen, K., & Namey, E. (2012). *Applied thematic analysis*. SAGE. https://doi.org/10.4135/9781483384436
Gutmann, A. (1987). *Democratic education*. Princeton University Press.
Gutmann, A., & Thompson, D. (1996). *Democracy and disagreement*. Harvard University Press.
Gutmann, A., & Thompson, D. F. (2009). *Why deliberative democracy?* Princeton University Press. https://doi.org/10.1515/9781400826339
Habermas, J. (1984). *The theory of communicative action: Vol. 1. reason and the rationalization of society (T. McCarthy, Trans.)*. Beacon. (Original work published 1981).
Habermas, J. (1991). *The structural transformation of the public sphere: an inquiry into a category of bourgeois society (T. Burger & F. Lawrence, Trans.)*. MIT Press. (Original work published 1962).
Habermas, J. (1996). *Between facts and norms: contributions to a discourse theory of law and democracy*. MIT Press.
Habermas, J. (2005). A genealogical analysis of the cognitive content of morality. In J. Habermas (Ed.), *The inclusion of the other* (pp. 3–38). Polity.
Hefter, M. H., Berthold, K., Renkl, A., Riess, W., Schmid, S., & Fries, S. (2014). Effects of a training intervention to foster argumentation skills while processing conflicting scientific positions. *Instructional Science, 42*(6), 929–947. https://doi.org/10.1007/s11251-014-9320-y
Hefter, M. H., Renkl, A., Riess, W., Schmid, S., Fries, S., & Berthold, K. (2018). Training interventions to foster skill and will of argumentative thinking. *The Journal of Experimental Education, 86*(3), 325–343. https://doi.org/10.1080/00220973.2017.1363689
Hemmler, V. L., Kenney, A. W., Langley, S. D., Callahan, C. M., Gubbins, E. J., & Holder, S. (2022). Beyond a coefficient: An interactive process for achieving inter-rater consistency in qualitative coding. *Qualitative Research, 22*(2), 194–219. https://doi.org/10.1177/1468794120976072
Hess, D. E. (2009). *Controversy in the classroom: the democratic power of discussion*. Routledge.
Hess, D. E., & McAvoy, P. (2015). *The political classroom: evidence and ethics in democratic education*. Routledge.
Hill, C. E., Knox, S., Thompson, B. J., Williams, E. N., Hess, S. A., & Ladany, N. (2005). Consensual qualitative research: An update. *Journal of Counseling Psychology, 52*(2), 196–205. https://doi.org/10.1037/0022-0167.52.2.196
Iordanou, K. (2022). Supporting strategic and meta-strategic development of argument skill: The role of reflection. *Metacognition and Learning, 17*(2), 399–425. https://doi.org/10.1007/s11409-021-09289-1
Iordanou, K., Kuhn, D., Matos, F., Shi, Y., & Hemberger, L. (2019). Learning by arguing. *Learning and Instruction, 63*, Article 101207. https://doi.org/10.1016/j.learninstruc.2019.05.004
Iordanou, K., & Rapanta, C. (2021). Argue with me': A method for developing argument skills. *Frontiers in Psychology, 12*, Article 631203. https://doi.org/10.3389/fpsyg.2021.631203
Jahr, D., Hempel, C., & Heinz, M. (2016). '…Not simply say that they are all nazis.' Controversy in discussions of current topics in German civics classes. *Journal of Social Science Education, 15*(2), 14–25. https://doi.org/10.4119/jsse-789
Kane, C. M. (1995). Fishbowl training in group process. *The Journal for Specialists in Group Work, 20*(3), 183–188. https://doi.org/10.1080/01933929508411342
Keegan, P. (2021). Critical affective civic literacy: A framework for attending to political emotion in the social studies classroom. *The Journal of Social Studies Research, 45*(1), 15–24. https://doi.org/10.1016/j.jssr.2020.06.003
Knight, J., & Johnson, J. (1997). What sort of equality does deliberative democracy require? In J. Bohman, & W. Rehg (Eds.), *Deliberative democracy: essays on reason and politics* (pp. 279–319). MIT Press. https://doi.org/10.7551/mitpress/2324.003.0013.
Kopperschmidt, J. (2014). *Argumentationstheorie zur einführung* (3rd edn). Junius.
Koschmann, T. D. (1999). Toward a dialogic theory of learning: Bakhtin's contribution to understanding learning in settings of collaboration. In C. M. Hoadley, & J. Roschelle (Eds.), *Proceedings of the Computer Support for Collaborative Learning (CSCL) 1999 Conference* (pp. 308–313). International Society of the Learning Sciences. https://repository.isls.org/handle/1/4333.
Kuhn, D. (2005). *Education for thinking*. Harvard University Press.
Kuhn, D. (2019). Critical thinking as discourse. *Human Development, 62*(3), 146–164. https://doi.org/10.1159/000500171
Kuhn, D., & Crowell, A. (2011). Dialogic argumentation as a vehicle for developing young adolescents' thinking. *Psychological Science, 22*(4), 545–552. https://doi.org/10.1177/0956797611402512
Kuhn, D., Hemberger, L., & Khait, V. (2017). *Argue with me: argument as a path to developing students' thinking and writing* (2nd edn). Taylor and Francis.
Kuhn, D., & Moore, W. (2015). Argumentation as core curriculum. *Learning: Research and Practice, 1*(1), 66–78. https://doi.org/10.1080/23735082.2015.994254
Kuhn, D., & Udell, W. (2007). Coordinating own and other perspectives in argument. *Thinking & Reasoning, 13*(2), 90–104. https://doi.org/10.1080/13546780600625447
Kuhn, D., Zillmer, N., Crowell, A., & Zavala, J. (2013). Developing norms of argumentation: Metacognitive, epistemological, and social dimensions of developing argumentive competence. *Cognition and Instruction, 31*(4), 456–496. https://doi.org/10.1080/07370008.2013.830618
Landwehr, C. (2012). Demokratische Legitimation durch rationale Kommunikation: Theorien deliberativer Demokratie [Democratic legitimation through rational communication: Theories of deliberative democracy]. In O. W. Lembcke, C. Ritzi, & G. S. Schaal (Eds.), *Normative Demokratietheorien: 1. Zeitgenössische Demokratietheorie* (pp. 355–385). VS Verlag für Sozialwissenschaften. https://doi.org/10.1007/978-3-531-94161-5_12.
Larrain, A., Freire, P., López, P., & Grau, V. (2019). Counter-arguing during curriculum-supported peer interaction facilitates middle-school students' science content knowledge. *Cognition and Instruction, 37*(4), 453–482. https://doi.org/10.1080/07370008.2019.1627360
Lee, Y. C. (2007). Developing decision-making skills for socio-scientific issues. *Journal of Biological Education, 41*(4), 170–177. https://doi.org/10.1080/00219266.2007.9656093
Leitão, S. (2000). The potential of argument in knowledge building. *Human Development, 43*(6), 332–360. https://doi.org/10.1159/000022695

Luginbühl, M., & Müller-Feldmeth, D. (2022). Oral argumentation skills between process and product. *Languages, 7*(2), 139. https://doi.org/10.3390/languages7020139. Article.
Luís, R., & Rapanta, C. (2020). Towards (*Re-*)Defining historical reasoning competence: A review of theoretical and empirical research. *Educational Research Review, 31*, Article 100336. https://doi.org/10.1016/j.edurev.2020.100336
Macagno, F., & Damele, G. (2013). The dialogical force of implicit premises: Presumptions in enthymemes. *Informal Logic, 33*(3), 365–393. https://papers.ssrn.com/abstract=2334999.
Mansbridge, J. (2015). A minimalist definition of deliberation. In P. Heller, & V. Rao (Eds.), *Deliberation and development: rethinking the role of voice and collective action in unequal societies* (pp. 27–50). World Bank.
Mansbridge, J., Bohman, J., Chambers, S., Estlund, D., Føllesdal, A., Fung, A., Lafont, C., Manin, B., & Martí, J. L. (2010). The place of self-interest and the role of power in deliberative democracy. *Journal of Political Philosophy, 18*(1), 64–100. https://doi.org/10.1111/j.1467-9760.2009.00344.x
Manzel, S., & Weißeno, G. (2017). Modell der politischen Urteilsfähigkeit – eine Dimension der Politikkompetenz [Model of political judgment – A dimension of political competence]. In M. Oberle, & G. Weißeno (Eds.), *Politikwissenschaft und Politikdidaktik* (pp. 59–86). Springer VS. https://doi.org/10.1007/978-3-658-07246-9.
Massing, P. (2003). Kategoriale politische Urteilsbildung [Categorical political judgment formation]. *Urteilsbildung im Politikunterricht. Ein multimediales Projekt* (pp. 91–108). Wochenschau.
Mayer, R. E. (2004). Should there be a three-strikes rule against pure discovery learning? *American Psychologist, 59*(1), 14–19. https://doi.org/10.1037/0003-066x.59.1.14
Mouffe, C. (2013). *Agonistics. thinking the world politically*. Verso.
Müller, S. (2022). Kontroversität [Controversy]. In W. Sander, & K. Pohl (Eds.), *Handbuch politische Bildung* (5th edn, pp. 231–239). Wochenschau.
Mundwiler, V., Kreuz, J., Hauser, S., Eriksson, B., & Luginbühl, M. (2017). Mündliches Argumentieren als kommunikative Praktik: Schulbuchübungen und empirische Befunde im Vergleich [Oral argumentation as communicative practice: Textbook exercises and empirical findings in comparison]. In Hauser, S., & Luginbühl, M. (Eds.), Gesprächskompetenz in schulischer Interaktion: Normative Ansprüche und kommunikative Praktiken (pp. 91–123). hep.
Nelsen, M. D. (2021). Cultivating youth engagement: Race & the behavioral effects of critical pedagogy. *Political Behavior, 43*(2), 751–784. https://doi.org/10.1007/s11109-019-09573-6
Noroozi, O., Kirschner, P. A., Biemans, H. J. A., & Mulder, M. (2018). Promoting argumentation competence: Extending from first- to second-order scaffolding through adaptive fading. *Educational Psychology Review, 30*(1), 153–176. https://doi.org/10.1007/s10648-017-9400-z
Nussbaum, E. M., & Edwards, O. V. (2011). Critical questions and argument stratagems: A framework for enhancing and analyzing students' reasoning practices. *Journal of the Learning Sciences, 20*(3), 443–488. https://doi.org/10.1080/10508406.2011.564567
Osborne, J. (2013). The 21st century challenge for science education: Assessing scientific reasoning. *Thinking Skills and Creativity, 10*, 265–279. https://doi.org/10.1016/j.tsc.2013.07.006
Osborne, J., Erduran, S., & Simon, S. (2004). Enhancing the quality of argumentation in school science. *Journal of Research in Science Teaching, 41*, 994–1020.
Peterson, A. (2009). Civic republicanism and contestatory deliberation: Framing pupil discourse within citizenship education. *British Journal of Educational Studies, 57*(1), 55–69. https://doi.org/10.1111/j.1467-8527.2009.00426.x
Petrik, A. (2016). Wenn wir kontroverse Werthaltungen Jugendlicher nicht ins Unterrichtszentrum rücken, dann vertiefen wir die Gräben zwischen ihnen und dem Phänomen des Politischen[If we do not place controversial value beliefs held by young people at the centre of our teaching, we will deepen the divide between them and the phenomenon of politics.]. Positionen der politischen bildung 2. *Interviews zur Politikdidaktik* (pp. 372–389). Wochenschau.
Pettit, P. (1997). *Republicanism: a theory of freedom and government*. Clarendon.
Przyborski, A., & Wohlrab-Sahr, M. (2014). *Qualitative Sozialforschung: ein Arbeitsbuch [Qualitative social research: A workbook]* (4th edn). Oldenbourg.
Rapanta, C. (2021). Can teachers implement a student-centered dialogical argumentation method across the curriculum? *Teaching and Teacher Education, 105*, Article 103404. https://doi.org/10.1016/j.tate.2021.103404
Rapanta, C., & Felton, M. K. (2022). Learning to argue through dialogue: A review of instructional approaches. *Educational Psychology Review, 34*(2), 477–509. https://doi.org/10.1007/s10648-021-09637-2
Rapanta, C., Garcia-Mila, M., & Gilabert, S. (2013). What is meant by argumentative competence? An integrative review of methods of analysis and assessment in education. *Review of Educational Research, 83*(4), 483–520. https://doi.org/10.3102/0034654313487606
Rawls, J. (1996). *Political liberalism*. Columbia University Press. http://archive.org/details/politicalliberal0000john.
Reznitskaya, A., Kuo, L., Clark, A., Miller, B., Jadallah, M., Anderson, R. C., & Nguyen-Jahiel, K. (2009). Collaborative reasoning: A dialogic approach to group discussions. *Cambridge Journal of Education, 39*(1), 29–48. https://doi.org/10.1080/03057640802701952
Richter, D. (2012). Politisches Argumentieren im Unterricht: Auf der Suche nach einem Analyseinstrument [Political argumentation in the classroom: In search of an analytical instrument]. In G. Weisseno, & H. Buchstein (Eds.), *Politisch handeln. Modelle, Möglichkeiten, Kompetenzen* (pp. 178–192). Bundeszentrale für Politische Bildung.
Sadler, T. D., & Zeidler, D. L. (2005). Patterns of informal reasoning in the context of socioscientific decision making. *Journal of Research in Science Teaching, 42*(1), 112–138. https://doi.org/10.1002/tea.20042
Saumure, K., & Given, L. M. (2008). Convenience sample. In L. M. Given (Ed.), *The sage encyclopedia of qualitative research methods* (p. 125). SAGE. https://doi.org/10.4135/9781412963909.
Schmidt, C. (1993). Einige technische und methodische Aspekte der Auswertung [Some technical and methodological aspects of analysis]. In C. Hopf, & C. Schmidt (Eds.), *Zum Verhältnis von innerfamilialen sozialen Erfahrungen, Persönlichkeitsentwicklung und politischen Orientierungen: Dokumentation und Erörterung des methodischen Vorgehens in einer Studie zu diesem Thema* (pp. 57–63). Institut für Sozialwissenschaften der Universität Hildesheim.
Schuitema, J., van Boxtel, C., Veugelers, W., & ten Dam, G. (2011). The quality of student dialogue in citizenship education. *European Journal of Psychology of Education, 26*(1), 85–107. https://doi.org/10.1007/s10212-010-0038-1
Schwaighofer, M., Vogel, F., Kollar, I., Ufer, S., Strohmaier, A., Terwedow, I., Ottinger, S., Reiss, K., & Fischer, F. (2017). How to combine collaboration scripts and heuristic worked examples to foster mathematical argumentation – when working memory matters. *International Journal of Computer-Supported Collaborative Learning, 12*(3), 281–305. https://doi.org/10.1007/s11412-017-9260-z
Shapiro, S., & Kouri Kissel, T. (2000). Classical logic. In E. N. Zalta (Ed.), *The stanford encyclopedia of philosophy*. Stanford University. https://plato.stanford.edu/archives/spr2021/entries/logic-classical/.
Stegmann, K., Wecker, C., Weinberger, A., & Fischer, F. (2012). Collaborative argumentation and cognitive elaboration in a computer-supported collaborative learning environment. *Instructional Science, 40*(2), 297–323. https://doi.org/10.1007/s11251-011-9174-5
Sunstein, C. R., & Hastie, R. (2015). *Wiser: Getting beyond groupthink to make groups smarter*. Harvard Business Review Press. http://archive.org/details/wisergettingbeyo0000suns.
Tawfik, A. A., Law, V., Ge, X., Xing, W., & Kim, K. (2018). The effect of sustained vs. Faded scaffolding on students' argumentation in ill-structured problem solving. *Computers in Human Behavior, 87*, 436–449. https://doi.org/10.1016/j.chb.2018.01.035
Thormann, S. (2012). Gelingt der politische Diskurs? Eine empirisch-qualitative Untersuchung im Oberstufenunterricht [Does political discourse succeed? An empirical-qualitative study in upper secondary education] Gesellschaft. *Wirtschaft. Politik, 61*(1), 109–121. https://nbn-resolving.org/urn:nBn:dE:0168-ssoar-96441-1.
Thormann, S. (2012). *Politische Konflikte im Unterricht. Empirische Rekonstruktionen zu Unterrichtsarrangements am Gymnasium [Political conflicts in the classroom: Empirical reconstructions of teaching arrangements at grammar schools]*. Springer VS.
Toulmin, S. (2003). *The uses of argument*. Cambridge University Press. (Original work published 1958).
Van Eemeren, F. H., & Grootendorst, R. (2003). *A systematic theory of argumentation: the pragma-dialectical approach*. Cambridge University Press. https://doi.org/10.1017/CBO9780511616389
Van Eemeren, F. H., Grootendorst, R., Johnson, R. H., Plantin, C., & Willard, C. A. (1996). *Fundamentals of argumentation theory: a handbook of historical backgrounds and contemporary developments*. Routledge.
Vogel, F., Kollar, I., Ufer, S., Reichersdorfer, E., Reiss, K., & Fischer, F. (2016). Developing argumentation skills in mathematics through computer-supported collaborative learning: The role of transactivity. *Instructional Science, 44*(5), 477–500. https://doi.org/10.1007/s11251-016-9380-2
Waldis, M., & Ziegler, B. (2022). Politische Bildung in der Schweiz [Civic education in Switzerland]. In W. Sander, & K. Pohl (Eds.), *Handbuch politische Bildung* (5th edn, pp. 574–582). Wochenschau.
Walton, D. N. (1989). Dialogue theory for critical thinking. *Argumentation, 3*(2), 169–184. https://doi.org/10.1007/BF00128147
Walton, D. N. (2006). *Fundamentals of critical argumentation*. Cambridge University Press.
Wells, G., & Arauz, R. M. (2006). Dialogue in the classroom. *Journal of the Learning Sciences, 15*(3), 379–428. https://doi.org/10.1207/s15327809jls1503_3
Wertgen, A. G., Münchow, H., Richter, T., & Tiffin-Richards, S. P. (2025). Lasting benefits of a web-based training in understanding informal arguments. *European Journal of Psychology of Education, 40*(1), 36. https://doi.org/10.1007/s10212-024-00930-6
Young, I. M. (1990). *Justice and the politics of difference*. Princeton Universtiy Press.
Young, I. M. (2000). *Inclusion and democracy*. Oxford University Press.
Youniss, J., & Levine, P. (2009). *Engaging young people in civic life*. Vanderbilt University Press.
Zhang, J., Wui, M. G. L., Nam, R., Relyea, J. E., & Wong, S. S. (2023). Improving argumentative writing of sixth-grade adolescents through dialogic inquiry of socioscientific issues. *Journal of Writing Research, 14*(3), 375–419. https://doi.org/10.17239/jowr-2023.14.03.03
Zohar, A., & Nemet, F. (2002). Fostering students' knowledge and argumentation skills through dilemmas in human genetics. *Journal of Research in Science Teaching, 39*(1), 35–62. https://doi.org/10.1002/tea.10008