SHOULD BRITAIN LEAVE THE EU? AN EXPLORATION OF ONLINE ARGUMENT THROUGH A TOULMIN PERSPECTIVE

LA GRAN BRETAGNA DOVREBBE LASCIARE L'UE? L'ESPLORAZIONE DI UNA ARGOMENTAZIONE ONLINE ATTRAVERSO LA PROSPETTIVA DI TOULMIN

Michael Hammond* and Marina Charalampidi

Centre for Education Studies, University of Warwick, UK, m.hammond@warwick.ac.uk, m.charalampidi@warwick.ac.uk

* Corresponding author

Abstract The paper shows how a framework adapted from Toulmin (1958) was valuable in exploring the force of online argument in an educational setting. In past research of online discussions there has been a focus on interaction patterns at the expense of exploring questions of content. In seeking to address this imbalance, we used Toulmin's key terms of *claim*, *data*, *warrant, rebuttal* and *backing* in an analysis of an educational network for young learners (13-18) in which a debate on whether Britain should leave the EU was carried out. Drawing on these key terms, a framework was constructed in order to categorise messages as: *claims with no force; insufficient argument; constructed argument; forceful argument*. This framework was used to unpack the claims and warrants put forward in the course of the debate. The paper shows that Toulmin's approach can be adapted to provide a feasible and useful framework for assessing the force of argument within forums. However, it is recognised that there are also challenges and limitations in using such an approach.

KEYWORDS Argument; Online Forums; Toulmin.

Sommario L'articolo mostra l'utilità di un framework adattato da Toulmin (1958) per esplorare la forza di una argomentazione online in un contesto educativo. Nelle ricerche precedenti sulle argomentazioni online ci si è concentrati sui modelli di interazione a scapito dell'esplorazione delle questioni relative ai contenuti. Nel cercare di affrontare questo

squilibrio, abbiamo utilizzato i termini chiave di *tesi* (*claim*), *dati* (*data*), *garanzia* (*warrant*), *riserva* (*rebuttal*) e *fondamento* (*backing*) di Toulmin nell'analisi di una rete educativa per giovani studenti (13-18) in cui è stato condotto un dibattito sull'eventualità che la Gran Bretagna abbandonasse l'UE. Attingendo a questi termini chiave, è stato costruito un framework per classificare i messaggi come: *tesi senza forza* (*claims with no force*); *argomentazione insufficiente* (*insufficient argument*); *argomentazione articolata* (*constructed argument*); *argomentazione forte* (*forceful argument*). Il framework è stato utilizzato per analizzare le tesi e le garanzie presentati nel corso del dibattito. L'articolo mostra come l'approccio di Toulmin possa essere adattato per fornire un framework utile per valutare la forza di un'argomentazione all'interno di un forum. Tuttavia, viene anche evidenziato che esistono sfide e limitazioni nell'utilizzo di tale approccio.

PAROLE CHIAVE Argomentazione; Forum online; Toulmin.

1. INTRODUCTION

The introduction of online environments, including online forums, blogs and other social networking, was once heralded as offering opportunities for inclusive debate in which members had the time and space to read and offer views undistracted by visual clues. These opportunities applied to not just teaching and learning contexts (Austin, 2006; Boyd, 1996; McConnell, 2000), but also to community networks and civil society more generally (Boshier, 1990; Rheingold, 1993; 2008). Such opportunities continue to exist but early enthusiasm has been dampened by awareness of the sometimes chaotic nature of participation in formal learning (Eve & Brabazon, 2008) and the tendency for social networking to reinforce existing beliefs, as in the phenomenon of 'echo chambers' (Boutyline & Willer,2017; Del Vicario et al., 2016), rather than support reflexivity and the exploration of counter argument. These difficulties have led to questions over the quality of online activity in general and concern over online argument in particular (Paglieri & Reed, 2017). However, if we are to criticise the conduct of online argument then we need to have some criteria for helping to identify what a good argument looks like. This paper suggests Toulmin's framework can help. In particular, it shows how Toulmin's key work (Toulmin, 1958) can be adapted to provide a feasible and useful tool for understanding the force of argument in online discussion.

The paper begins by looking at the education technology approach to analysing online interaction before shifting to consider how argument has been treated in the education literature. This shift leads us directly to Toulmin and his framework based around the analysis

of claim, data, warrant and backing in an argument. We then move on to showing how the Toulmin framework was adapted to analyse a discussion about leaving the EU, one which took place in an educational network for young learners (13-18). Finally, the strength of the Toulmin approach are discussed along with its limitations.

2. THEORETICAL BACKGROUND

2.1 Analysis of online knowledge building: The educational technology tradition

In seeking to deepen our understanding of online discussion one well-trodden path is to present frameworks for analysing the messages themselves, in other words: what are these messages designed to do? Here much of the work in the field of educational technology research has focused on knowledge building communities and communities of practice (Anderson, 2004; Cacciamani, Perrucci, & Khanlari, 2018; Garrison, Anderson, & Archer, 2010; Gunawardena, Lowe, & Anderson, 1997; Henri & Pudelko, 2003; Lee, Son, & Lee, 2005; Salmon, Nie, & Edirisingha, 2010; Scardamalia & Bereiter, 2014; Zhang, Scardamalia, Reeve, & Messina, 2009). Early work in this tradition made recurring reference to Henri (1992) in which an analytical model based around participation, interaction, social, cognitive and metacognitive dimensions of messages was proposed. Later, Gunawardena, Lowe and Anderson (1997) put forward an 'interaction analysis' model in order to show the social construction of knowledge around five phases starting with the sharing and comparing of information, through to noticing inconsistency and negotiation of meaning, and finishing with agreement or application of newly constructed meaning. Meanwhile, Garrison, Anderson and Archer's (2010) Community of Inquiry model contained three elements, namely social, cognitive and teaching presence, and Salmon, Nie and Edirisingha (2010) proposed a five-stage model, which categorised participation from access and motivation, through information exchange leading to knowledge construction development. Many researchers have used these schema creatively to come up with new models, for example Ke and Xie (2009) categorise interactions into three dimensions (socializing, knowledge construction and regulation of learning), while Pezzotti and Gambini (2012) draw creatively on knowledge construction literature and extend it in important ways.

Frameworks have considerable value for mapping patterns of argument, counter argument and consensus as they can help to identify critical processes in online participation. It seems likely, for example, that the construction of knowledge will take place at, say, the level of negotiation of meaning rather than socialisation, and that evidence of counter argument

suggests a robust process of debate. Indeed, a stimulus to pioneer researchers in the field of online text analysis was the possibility of being able to quite literally chart the construction of new knowledge as message archives seemed to provide a complete account of interaction within a group. However, if such a goal was to be achieved then researchers needed to get the categorisation of messages right. In particular, they needed to explain not only how new knowledge was created but why this new knowledge was worth paying attention to. However here was a gap. After all members of a group may construct knowledge by articulating claims and addressing counter claims, but do any of the agreements which participants arrive at carry any force? Of course validity criteria are not entirely absent from many of the schema used to analyse online texts. For example, Gunawardena, Lowe, and Anderson (1997) suggested that any new knowledge co-constructed by members should be tested against cultural assumptions; experience; cognitive schema; testimony and data. Garrison, Anderson, and Archer (2001) saw a kind of pragmatic claim to new knowledge as its usefulness in practice. Scardamalia and Bereiter (2014) drew attention to processes, e.g. offering insightful interpretation or providing supportive/disconfirming findings, which needed to be present in creating authentic knowledge. And Pezzotti and Gambini (2012) put forward content indicators ('Indicatori di contenuto') in respect to the source of knowledge on which participants draw. However, we argue that these fall short of offering the kind of forensic analysis needed to establish the quality of an argument. This leads to the wider question, 'Can the quality of argument really be evaluated?'. One place to look for an answer is the educational literature.

2.2 The education literature on argument

Argument has been explored in many contexts, chiefly in school, and has been particularly well represented in science education with major projects carried out at the turn of the last century (Erduran, Simon, & Osborne, 2004; Pontecorvo, 1987; Schwarz, Neuman, Gil, & Ilya, 2003). Argument is consistently seen as productive for learning and a form of discourse that needs to be appropriated by children and explicitly taught (Erduran et al., 2004). Engaging in argument encourages learners to externalise their thinking and hold it up to self-scrutiny, and the scrutiny of others, for it is through argument that learners are led to explore the relationship between evidence and claim (Stegmann, Weinberger, Fischer, & Mandl, 2014). Nussbaum, Hartley, Sinatra, Reynolds, and Bendixen (2004) tie argument closely to the idea of higher order thinking and Duschl and Osborne (2002) see argument as contributing to the development of three cognitive dimensions: one is 'metacognitive processes' (knowing

how to learn); the second is 'metastrategic processes' (knowing which strategies to deploy); and the third is 'epistemological framework' (an understanding of how we know).

Given what has been said about its value, the teaching of argument should be a priority across all sectors. However, there is one overriding conclusion to be drawn from the literature: there have been, and continue to be, considerable weaknesses in the conduct of argument (Kuhn, 1992; Nussbaum, Hartley, Sinatra, Reynolds, & Bendixen, 2004; Stegmann et al., 2004). Kuhn and Pearsall (2000) forensically examine some of these weaknesses. For example, in many cases concerning young people's scientific understanding argument stopped with covariation (X rises with Y hence X must be the cause of Y). Other weaknesses include engaging in counterfactual reasoning (presenting alternative accounts of what actually happened), discounting (ignoring more comprehensive explanations for preferred ones) and analogy (a tendency to think about objects of inquiry in terms of what was already familiar). A key feature of weak argument is its failure to engage with alternative explanations and its reliance on 'pseudoevidence' (Nussbaum & Schraw, 2007). Nussbaum et al. (2004) further suggest that a good argument successfully integrates argument and counterargument. Indeed, students often do not realise that considering and rebutting a counterclaim often increases the persuasiveness of their argument.

Conducting an argument is not straightforward. At the individual level, argument is seen as carrying a high cognitive load (Coirier, Andriessen, & Chanquoy, 1999), allied to which many students seek to maintain 'cognitive consistency' rather than consider new explanations (see the review by Simon & Holyoak, 2002). Underlying resistance to argument at both individual teacher and student levels are: beliefs about epistemology (for example, difficulty in accepting the fallible nature of knowledge and hence the need for argument at all); personality type (for example, the difficulty some experience in accepting uncertainty); and preferred learning style or a preference for surface rather than deep learning (Oh & Jonassen, 2007). At a macro level, there are further constraints, for example the prevailing emphasis on testing recall of knowledge, and gaps in teacher training (Simon, 2008). Not surprisingly, many researchers, including Anderson, Guerreiro, and Smith (2016), Littleton & Whitelock (2005) and Mercer (1995) have seen the need to assist young people in developing argument skills and for supporting teachers in leading and modelling argument.

2.3 Toulmin and what makes a good argument

It is one thing to propose the modelling of argument, but what should this modelling consist of? To answer this question, we need to know what a 'good' argument looks like and here a

recurring point of reference has been, and remains, Stephen Toulmin. Toulmin's *Use of Argument* (1958) has been adopted in many areas including linguistics, psychology, philosophy, law and politics. More crucially, for this paper, Toulmin has also been influential in education. For example, Bacha (2010) and Qin & Karabacak (2010), along with many others, have used the Toulmin framework for analysing and supporting academic writing in higher education. In school contexts, Toulmin has been influential in science education (Erduran et al., 2004; Jimenez-Aleixandre, Rodriguez, & Duschl, 2000) and is a point of reference for many other disciplines (Lee, 2017; Pontecorvo & Girardet, 1993). Toulmin has, however, only rarely been applied in an online context (Blake & Scanlon, 2014).

The basic idea of Toulmin's *Use of Argument* is that arguments can be considered in terms of *claims*, *data*, *warrant*, and *backing*. The *claim* (C) is the argument whose merits we are seeking to establish (for example, 'the moon is made of cheese'). The *data* (D) are the facts we appeal to as a foundation for the claim ('the moon looks like a round cheese'). The *warrant* (W) covers more general hypothetical statements, which can act as bridges, to make the argument coherent ('given the moon is round and certain cheeses are round we can conclude that the moon is made of cheese'). Any warrant and claim can be qualified by, for example, saying 'the moon might/could be made of cheese' but other claims are possible. Arguments generally proceed by claim and *counter claim* (CC) and CCs can similarly be supported by data, warrant and backing. All claims can be subject to *rebuttal* (R) (for example, an acceptance that the claim being put forward is a partial and not a general case, such as in 'moons are generally made of rock but the Earth's moon is different'*)*. Finally, an argument needs *backing* (B). This refers to the background understanding in a particular field that would give authority to the warrant. In the moon example there is an implicit but quite erroneous backing for the claim in the idea that the appearance of a physical object, in relation to known objects, has geological significance. Backing then is extremely important and as Toulmin puts it 'to call such an argument formally valid is to say only something about the manner in which it has been phrased, and tells us nothing about the reasons for its validity. These reasons are to be understood only when we turn to consider the backing of the warrant invoked' (Toulmin, 1958, p.132). One issue here is that while data are generally appealed to explicitly, the backing and even the warrant is often left implicit in an argument. In discussing planetary movements, for example, astrophysical laws do not need to be, and more importantly cannot be, endlessly repeated so long as they are accepted by all participants.

Toulmin is often evoked to provide grounds for establishing the validity of arguments though Toulmin himself more usually wrote about the 'force' of an argument. As Toulmin put it,

there was a structure to argument (including elements of claim, data, warrant, backing, rebuttal) which was common across all argument (i.e. field independent), but there was discipline knowledge that needed to be brought to an argument which was field dependent. This put Toulmin at odds with logicians, in that he argued there was much more to consider about a text than its formal structure, but later he was also at odds with post-structuralism by arguing that there was an identifiable structure to a text. Post-structuralists emphasised the multiple meanings which a text afforded and the instability of language, for all meaning was nested within other meaning (Elliot, 2014). By contrast, Toulmin had found a way of moving against the logical positivist tradition, while maintaining an interest, drawing on Aristotle, in how logical reasoning can play out in practical contexts. His stance was a largely pragmatic one which aimed to integrate objectivist and subjectivist ways of thinking and this position remained broadly consistent throughout his career (Toulmin, 1977).

There were other frameworks both within the educational technology and classroom talk literature which appeared easier to apply (for example, the categories of disputational, cumulative and exploratory talk in Littleton & Whitelock, 2005), but there were three things which attracted us to Toulmin as an approach to understanding online argument. First, his schema did not solely focus on the form an argument took (as was the case in much of the knowledge building literature), it had to consider knowledge of the field. In fact, Toulmin tended to equate field with discipline knowledge, but in this paper content knowledge is used to better reflect that backing for arguments often cuts across discipline or subject boundaries. Second, his broadly pragmatic stance on knowledge made Toulmin seemed to fit well with the anti-foundational ontology often associated with those proposing online discussion (McConnell, 2000). Third, there was a great deal of literature on the use of Toulmin in physical classrooms on which to draw when examining online settings.

3. METHODS

3.1 Context for the research

We wanted to consider whether Toulmin's use of argument could help in analysis of online debate, in particular whether it could fill a gap by identifying the force of the claims that members were putting forward in a way that the knowledge construction literature had not. To do so called for empirical investigation. The context for this investigation was an educational online network, namely IGGY. IGGY was created at the University of Warwick for academically 'gifted' young people, aged 13 to 18 and it ran from 2012–2017. Membership of

the network was open to any young person in that age group whose parents, carers or teachers vouched that it would be of value to them.

IGGY was a distinctive example of an online network as it offered members social interaction with people that in many cases they had not physically met. In addition, it offered a good deal of structured, optional, learning content covering areas such as history, politics, science, languages and so on (see Charalampidi, Hammond, & Boddison, 2014). According to IGGY's database, the network had around 7,000 active members. These members came from all over the world, though most lived in the UK. The majority of the members were female but data on gender were not routinely collected. An important feature of IGGY was the high level of participation safety so that the network was closed to non-members, members used anonymised avatars and participation was monitored carefully by organisers for inappropriate activity.

We had already carried out a great deal of work aimed at understanding members' perspectives on participation in IGGY (Charalampidi & Hammond, 2016). For example, active members tended to use the network for a number of reasons: to address lack of challenge at school, to access learning resources, to meet new people, to communicate with other members, and to learn about other cultures. IGGY was an educational community within which those who actively participated felt trust, empathy and respect. The main constraints in using IGGY was lack of time and learning to navigate the network which meant that some members were not active, or only active in particular areas - for example some accessed the learning materials but did not take part in discussion, and some accessed the discussions but not the learning material.

In this paper our interest lies in the forums within IGGY. IGGY had designated broad topics for debate, for example *Writing wrongs; Essay competition; Careers and personal development; What's it like to be gifted; Education and the internet; and Politics*. Many debates ran concurrently so that although each debate thread only generated modest numbers of contributions, discussion as a whole was widespread and frequent. The forum archive was organised around 15 themes with 5,389 topic threads and 47,004 messages in its first four years. Our study focused on one of the more topical and discursive debates in the Politics section, *Should UK leave the EU?* This debate took place from May 2015 to June 2016, with 103 contributions from 49 forum members, including two student mentors. Other debates were analysed too and details of a comparative study are provided in a supplementary file to this paper (Hammond & Charalampidi, 2019).

Before carrying out the analysis of the EU debate reported here we had already carried out quantitative analysis of several debates (including data on the number of contributions and the pattern of contributions) and a functional analysis of large units of meaning using the key codes *Triggering a discussion (T), Inviting a response (R)* and *Stating (S)* (Charalampidi & Hammond, 2016). This work was helpful in understanding the flow of argument but it was of limited value in helping to understand the force of argument. This is what led back to Toulmin.

3.2 The framework of analysis

Toulmin needed adapting if it was to be used as a way of understanding the comparative merits of arguments. We drew heavily on a framework constructed by Erduran, Simon, and Osborne (2004) and Simon (2008) in which five different levels of argument were identified. They range from Level 1, a simple claim without supporting data, to level 5, a claim with data, warrant, and backing with a recognition as to how the claim may be qualified or rebutted. This framework, however, needed further adaption. First, numerical labels (1, 2, 3, 4, 5) were replaced with something more descriptive. Second, each level was broadened, for example our category *insufficient argument* could capture different types of weakness including absence of W but also lack of clarity in respect to W. Third, Erduran et al.'s level 5 ('displays an extended argument with more than one rebuttal') set the bar too high. Indeed, Toulmin's own work on argument seemed driven by an interest in jurisprudence and how legal arguments were constructed in order to integrate different claims within quite long and detailed texts. In contrast, in this study the texts were shorter and were made by young learners, rather than practising lawyers.

Four categories were constructed to describe participant contributions: *claims with no force; insufficient arguments; constructed arguments* and *forceful argument* with a fifth category (*uncoded*) to cover messages which did not contain claims. For example, a message (which constituted the unit of meaning) that simply stated that immigration would go down if the UK left the EU was a claim with *no force*. If this claim was complemented by a general statement about border controls, then this made an *insufficient argument*. If the message contained a coherent bridge between having border controls and levels of immigration this would make a *constructed argument*. Meanwhile, a *forceful argument* would bring greater clarity, for example it might present data on levels of migration, it might bring in qualifications, such as recognition that much would be uncertain post-Brexit, as well as reflection on why migration

was considered a good or bad thing. Table 1 illustrates extracts from posts to give an idea as to the application of the framework.

Level	**Definition** **(C=Claim, D=Data, W=Warrant, B=Backing)**	**Extract: Illustrative examples**
No Force	C made without D or where the link between D and C is unclear, or where D is factually incorrect (often with a deceptive intention)	A standalone statement: *I think that we should stay in the EU* *Leaving the EU could be a breath of fresh air* *All laws require EU approval* *We are a very small island we are very vulnerable*
Insufficient Argument	C made with supporting D. The W can be deduced but is not clear	*We should leave.* [C] *We are in a lot of debt and will continue to lose money if we continue to send it to countries in the EU.* [D] *We should stay* [C]. *The EU provides us with back up in case a war breaks out* [D]
Constructed Argument	C made with supporting D, and with an explicit W or a W that can be easily identified	[C] *Stay…..Several large companies have suggested that if the UK leaves the EU they will also move away from the UK, meaning that jobs here will be lost.* [D]
Forceful Argument	As above but generally longer. D is explored critically while B is referred to or easily deducible R and Q strengthen rather than weaken argument	*I am fully aware of how immigration is good for our work force, but in my opinion the social and environmental detriments are a major factor* [R] *As a UK resident with a French nationality, I believe leaving the EU will not only impact me and my family but all those who have immigrated from the EU to England.* [Q]
Uncoded	No argument being expressed	These covered clarification or correction of facts, links to news or links to other resources, and trigger questions for discussion.

Table 1: Level descriptors used for categorisation of messages

Applying the framework was not straightforward. Indeed, the debate on EU membership was particularly difficult as it threw up a range of issues whose importance was not agreed upon and the merits of which crossed different fields: economics, law, moral conduct and politics. For example, participants were drawing on claims about the contribution of EU membership to economic performance but also assessing whether national sovereignty was more or less

important than economic output. Moreover, claims rested in part on counterfactuals: *what would happen* to the economy if UK left the EU or *what would have happened* if UK had not had joined in the first place. We were challenged throughout to reach agreement as what counted as relevant data and we were further challenged to background our own feelings about EU membership, for example by recognising a tendency to over-compensate when analysing positions with which we disagreed. Finally, we had decided to categorise at a whole text level but this required best-fit judgments in the case of longer messages containing different types of claim.

On our first run with the coding framework we, the two authors of this paper, reached agreement in 55 out of the 103 messages. There was a high level of consistency in applying the codes *uncoded, no force* and *insufficient* but less consistency in applying the categories of *constructed argument* and *forceful*. At this point we engaged in a prolonged discussion as what was reasonable in the terms of content knowledge for this group of participants. In a second round we found consistency in 27 out of the 58 disputed codes, and reached agreement over the remaining 31 after further conversation. We refer back to the issues this search for agreement raises in the discussion.

4. FINDINGS

The messages (n=103) were categorised across the full range of levels (Table 2) with *constructed argument* the modal category. After taking away the *uncoded* category, the number of *constructed* and *forceful* arguments just outweighed the combined total of *no force* or *insufficient* arguments. This suggests that the quality of argument was varied but did at times reach an impressive level for this age group.

Codes	**Should Britain leave the EU?**
No force	26 (25.2)
Insufficient argument	15 (14.6)
Constructed argument	30 (29.1)
Forceful argument	13 (12.6)
Uncoded	19 (18.4)
TOTAL	103 (100.0)

Table 2. Frequency with which messages were coded (percentages in brackets).

Having constructed the framework for analysis, the nature of the claims put forward about the EU could be unpacked by breaking down the D, W and B that underlay claims. There was agreement by both 'Remainers' and 'Leavers' that the issues at stake covered the economic, political and social consequences, including migration and security (Table 3).

Claims	**Data**	**Warrant**	**Backing**
UK should stay in the EU (n=42 messages)	*Economic* Manufacturing has an EU wide supply chain; trade easier with EU as it is tariff free; data on costs offered by leave side is misleading; migrants don't steal jobs. Alternatives to EU are unsatisfactory: new trade and political relationships are unlikely / will bring risks / too much is unknown; freer trade with rest of the world is unlikely; freer trade if possible may result in flooding of cheap goods. *Political and social* Political security stronger within EU; EU protects and rebalances resources; third country migration needs to be tackled at an EU level; disruption and loss to those who have moved to UK from EU and to EU from UK; travel in EU is now straightforward; crises need to be tackled at EU level.	EU provides economic and political security. Free movement within the EU brings economic advantages. Disruption is damaging. EU is an effective political organisation.	Economic prosperity is based on secure relationships. Trade is a principle concern in political decision making; free movement balances demand and supply. Secure political alliances depend on trade blocks. Problems are international/ global not national.
UK should leave the EU (n=42 messages)	*Economic* EU is a declining trade block; financial cost of membership is too high; countries of EU are unevenly developed; trade outside EU is subject to tariffs; leaving will give more freedom to trade with other countries outside EU; free movement threatens jobs. *Political /social*	More freedom over trade deals will bring economic advantages. Countries require bespoke economic policies. Migration controls will result in more jobs for UK people.	A protected labour market has predictable consequences for employment. Political decisions at the EU level can interfere with sound economic policies.

	Immigration (via EU) brings social disruption; little control over EU decisions e.g. tax and migration; EU not responsive to member countries; a points based system for migration possible outside EU.	Control over migration could lead to more beneficial systems.	National sovereignty is rational and mutually beneficial at a worldwide level.
Undecided	Difficult to get full information; pros balance cons; too much uncertainty; alternatives have not been explained		
No view expressed	Requests for more information; links to sites; expressing thanks for contributions		

Table 3: The architecture of the debate.

There was an exact balance between messages supporting Remain and Leave in the discussion though among participants there were slightly more Remainers than Leavers. These data seem to run counter to the general idea that young people were *overwhelmingly* positive towards the EU (in regards to the UK, see Sloam, 2016).

5. DISCUSSION

The study began by suggesting there was a problem with how we considered online message analysis and by asking whether it was both feasible and useful to adapt a Toulmin framework to assess the quality of an argument. We found that it was.

As regards feasibility, it was possible to draw on Toulmin to construct a framework to categorise the messages within the forum in terms of *claims with no force; insufficient arguments; constructed arguments* and *forceful argument*. We found this framework was workable and gave important insight into the quality of the debate. It should, however, be made clear that although Toulmin was preferred to more complex frameworks (including Walton, 2015), categories were not easy to apply. This was because *warrant* and *backing* are rarely made explicit in an argument, they need to be inferred and different readers will infer different things. Once content comes into the analysis then coding becomes more difficult, and more difficult than generally recognised. To consider content, coders require an understanding of the subject matter: what they know about a topic; how they came to know about that topic; what data and what patterns of association are allowable within a topic area and so on. Judgments about content knowledge have to be appropriate for forum members, in this case what can be expected from this particular age group. This suggests that

categorisation will always be influenced by the positionality of those carrying out the analysis and decisions arrived at will be based on best fit. In this respect the concept of inter-rater reliability, with its focus on the search for consistency, comes with positivist associations (Anderson, Guerreiro, & Smith, 2016) which distort the process of reaching agreement. In our study we found a lack of consistency was not only inevitable but also valuable in reaching a critical shared understanding of how the codes should be applied.

Toulmin's interest in content knowledge is then a source of difficulty for the coder but also a source of strength for analysis. Toulmin does not provide a checklist against which claims can be considered true or false, but by adapting his approach we could offer explicit grounds for saying why one argument appeared better than another. Furthermore, while Toulmin is largely used to assess the force of argument at a micro level (the claims put forward in a particular text) we were able to use a Toulmin framework to show the architecture of a debate, i.e. the nature of the particular claims, the types of data considered relevant, and the warrants and backings that were being offered. Our results show that it is possible to make a forceful argument both for leaving and remaining in the EU. Forceful arguments engaged with a broader set of issues (for example, levels of migration from outside the EU in debates about border control) and indicated how interpretations were distorted by experience and position (for example, some participants from EU countries recognised they had a special interest if living in the UK). It is often assumed by those debating EU membership that there must be predictable outcomes from leaving the EU in relation to issues such as migration, economic prosperity and security. Those arguing more forcefully showed it was more complicated than that.

A Toulmin approach appears both feasible and useful but it does come with some limitations. First, we cannot rely on Toulmin to understand the educational value of argument, we need to go back to the education literature. Here argument is seen as an important educational goal (Duschl & Osborne 2002; Mercer, 1995; Nussbaum et al., 2004; Stegmann et al., 2014) and networks like IGGY should be seen as providing an important apprenticeship in argument. In this sense the willingness to put ideas forward, to consider other viewpoints and to change one's mind in the face of a stronger argument are important qualities or 'virtues' in themselves (Cohen, 2017). A distinction made by Bowell and Kingsbury (2013) helps in understanding argument as virtue. They see two approaches: the reliabilist position, which is more focused on standard cognitive reasoning, and the responsibilist one, in which the arguer is prepared to follow the argument wherever it leads. Metaphorically the first seems suggestive of a lawyer weighing up a brief, the second of more a detective following a trail. These two positions are

not incompatible but Toulmin leads us to focus more on the former at the expense of the latter. Different categories are needed to go down the responsibilist route and here, as an example, Schwarz and De Groot (2007) argue that developing autonomy, collaboration, commitment to reasoning, ethical communication and procedural mediation are important foci for analysis.

Second, a particular gap in the Toulmin approach is that, unlike the Habermasian perspective with which it shares a broadly pragmatic orientation, it does not engage with a wider sociological tradition (Hammond, 2015). This means Toulmin has little to say about how power is exercised, implicitly or explicitly, within groups or how our reading of a text takes place in a wider context – compare here with externalisation and socialisation as issues in van Eemeren and Houtlosser's (2015) pragma-dialetics.

Third, a shortcoming in Toulmin is that he is focused on content rather than voice and register. In fact, our interest in this debate was triggered by an appreciation that contributions in IGGY lacked the vitriol that seemed ever present in public forums on EU membership at the time. For example, disagreements among these younger participants were often tempered by recognition that others might see the same facts in a different way and disagreement was focused on the argument not on the person. This civility pointed again to the educational purpose of the forum but to understand how and why such civility was maintained we would need, again, to go beyond message analysis and explore intentions of those involved.

Finally, not all educational networks created for young people need have the same commitment to argumentation. They may, for example, seek to support the development of social capital (Tomai et al., 2010), the negotiation of adolescence (Subrahmanyam & Greenfield, 2008), or offer less formal learning in affinity groups (Gee, 2005). Networks which support argument are of special interest due to their avowedly educational nature but we should not see all activity as argument.

6. CONCLUSIONS

This paper explored the feasibility and usefulness of a Toulmin framework for understanding the quality of online discussion. It found that past research in the educational technology field left questions about the concept of online knowledge construction and methodological gaps in terms of analysis of content. The education literature filled in some of these gaps by reporting on the educational value of argument, the challenges in promoting argument, and alternative ways in which argument could be analysed. This literature led to Toulmin and the attraction of a Toulmin framework was threefold: it would consider content as well as form; rest on a

broadly pragmatic epistemology; and draw on an established research tradition. A Toulmin framework was then adapted to enable analysis of a discussion on whether should leave the EU. We concluded that this framework was feasible in that researchers were able to reach agreement on coding messages. However, such coding was necessarily challenging as it needed to consider content knowledge - both researcher and participant content knowledge. We further concluded that the framework was particularly useful for providing a focus on content and for allowing judgements on the quality of the debate. We see considerable value in a Toulmin approach though note that any framework needs to be adapted to the particular context of a study. We also argue for a range of approaches to online message analysis to reflect the spread of research questions which researchers ask and note there are other foci for research than the force of argument.

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