Academic Domains as Political Battlegrounds

A Global Enquiry by 99 Academics in the Fields of Education and Technology

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Notes for Practitioners

What is already known about this topic:

- This article sees an academic domain as a loose entity with a functional relationship between its human elements (i.e., scholars) and its non-human elements (i.e., structural configurations). These two kinds of elements collaborate with and compete against one another, and in so doing compose the identity of their academic domain. This conception seems not to have explicitly constituted a major component of the contemporary theoretical literature up to now.
- The article uses as a case study the academic domain of education and technology (E&T) to examine the relationship between its human and non-human components. It is therefore not an investigation into the *content* of E&T *per se*; rather, it is an examination of the daily *social* involvement of E&T scholars in their academic sphere. A literature review reveals a scarcity of texts devoted to this social involvement.
- A worldwide collection of academics (99 authors) have collaborated to co-author the article in a defined way. This authorship approach is innovative and is named in this article 'crowd-authoring'.

What this paper adds:

- This article has shown the existence of a two-way (yet not necessarily balanced) power (and thus political) relationship between the human and non-human constituents of an academic realm, with the two forming one another. This turns academic realms into political (functional or dysfunctional) 'battlefields' wherein both humans and non-humans engage in political activities and actions that form the identity of the academic realm.
- This article has shown the value of going beyond the academic enquiry into merely the *content* of E&T to consider an enquiry into the *social* space of E&T researchers.
- This article has pointed out the usefulness of establishing an intellectual platform wherein a crowd of academics, from around the world, come together to compose an article in a systematic way.

Implications for practice and/or policy:

- This article has identified ways in which E&T scholars have shaped and have been shaped by the structural characteristics of their academic domain. An implication for theory development is that the non-human elements of an academic domain (i.e. its structural configurations) should be seen as political 'actors', just like human elements, having 'agency' that they exercise over humans. Seeing the E&T academic domain from such a political perspective of power is a novel approach.
- Although E&T academics have subjected others (i.e., the so-called 'target audience' or users of E&T systems) to detailed qualitative and quantitative investigation, they have not targeted themselves, their academic fellows and the structural attributes of their own academic domain. An implication for policy is that E&T academics should be encouraged to enquire into their own academic domain and see themselves as both the

conductors and subjects of their research, playing the dual role of the researcher and the researched.

- The innovation of crowd-authorship has turned out to be feasible and moreover beneficial. An implication for practice is that this innovation is expected to produce advances within E&T scholarship and scholarship in other fields, compared with authorship approaches found in the typical model of scholarly publishing.

Abstract

This article theorises the functional relationship between the human components (i.e., scholars) and non-human components (i.e., structural configurations) of academic domains. It is organised around the following question: in what ways have scholars formed and been formed by the structural configurations of their academic domain? The article uses as a case study the academic domain of education and technology to examine this question. Its authorship approach is innovative, with a worldwide collection of academics (99 authors) collaborating to address the proposed question based on their reflections on daily social and academic practices. This collaboration followed a three-round process of contributions via e-mail. Analysis of these scholars' reflective accounts was carried out, and a theoretical proposition was established from this analysis. The proposition is of a mutual (yet not necessarily balanced) power (and therefore political) relationship between the human and non-human constituents of an academic realm, with the two shaping one another. One implication of this proposition is that these non-human elements exist as political 'actors', just like their human counterparts, having 'agency' – which they exercise over humans. This turns academic domains into political (functional or dysfunctional) 'battlefields' wherein both humans and non-humans engage in political activities and actions that form the identity of the academic domain.

Keywords: education, technology, academia, power, organisational politics, academic domain.

1. Introduction

This article examines the ways in which scholars shape and are shaped by the structural characteristics of their academic domain. It uses as a case study the academic domain of education and technology (E&T) to investigate this issue. E&T is used in this article to signify, simply, the area that lies at the intersection of the discipline of education and the discipline of technology. This article is not an investigation of the *content* of E&T *per se*; rather, it is an examination of the daily *social* involvement of E&T scholars in their academic sphere. A literature review reveals an abundance of texts devoted to researching the content of E&T, yet there has been limited research about the social space of E&T researchers (Hammond *et al.*, 1992; Cornford and Pollock, 2003; Msweli, 2012). Put simply, although E&T academics have exposed *others* (i.e., the so-called '*target* audience' or users of E&T systems) to detailed qualitative and quantitative investigation, they have not targeted themselves, their academic fellows and the structural attributes of their own academic domain. This article addresses this limitation by establishing an intellectual platform that has enabled 99 scholars from around the world to subject themselves and their academic peers to investigation, and to critically reflect upon their everyday social involvement with their scholarly community. These scholars have enquired, in particular, into the functional relationship between themselves and the structural features of their academic dominion.

2. Conceptual Framework

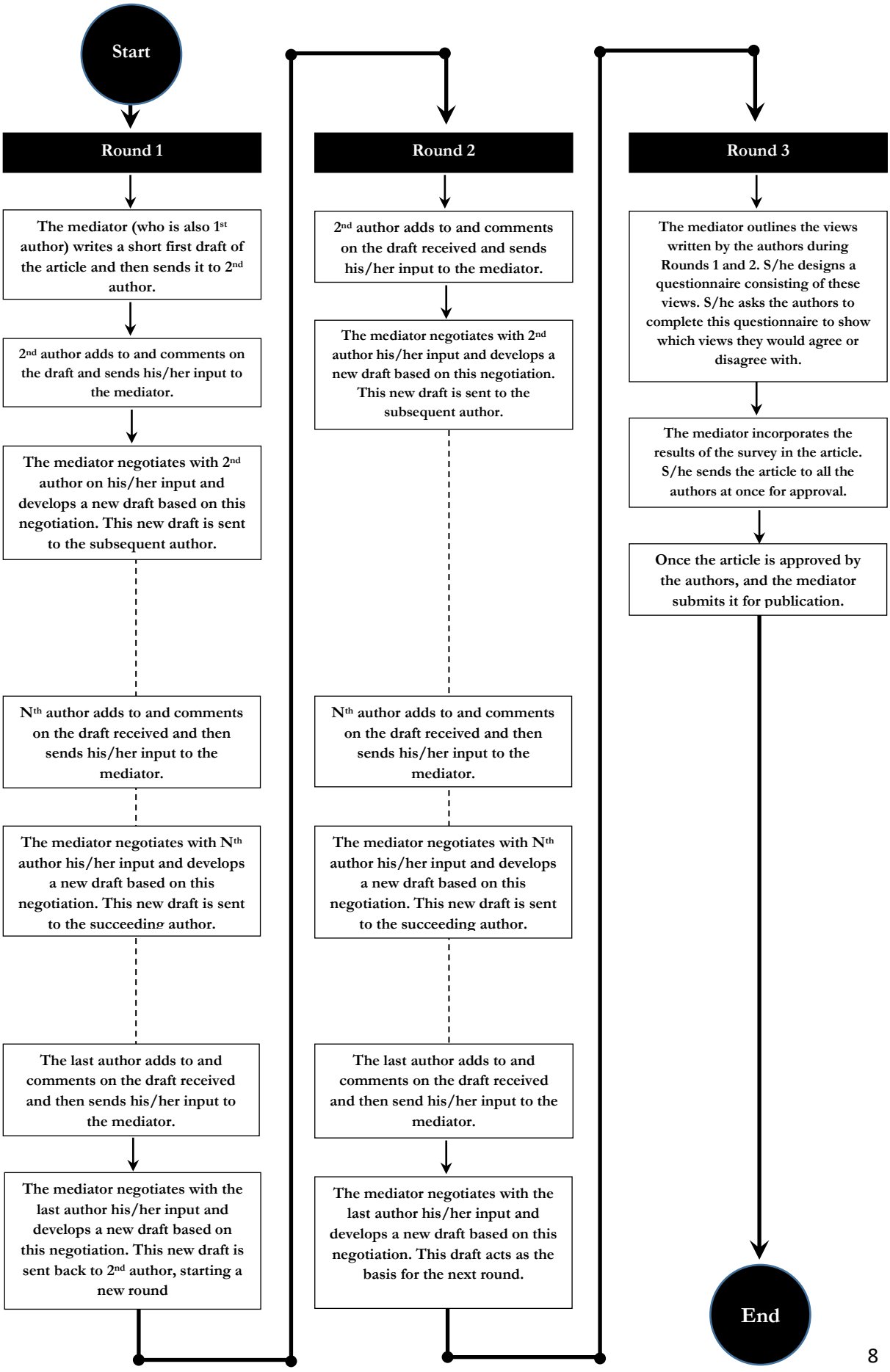
The conceptual framework of this article sees an academic domain as a 'loose entity' (Weick, 1976) with a functional relationship between its human elements (i.e., scholars) and its non-human elements (i.e., structural configurations) (Bertalanffy, 1969; Ellison *et al.*, 2007). These two kinds of elements collaborate with and compete against one another, and in so doing compose the identity of their academic domain (Giddens, 1984; Frozzi and Mazzoni, 2010; Sidhu *et al.*, 2011; Steinfield *et al.*, 2012). Part of the literature emphasises the ascendency of human elements over non-human elements, showing the inability of structural configurations to exist without human agency (cf. Bhaskar, 1989; Rieber, 1998; Carr-Chellman, 2006). On the other hand, another aspect of the literature emphasises the implicit power of non-human elements over humans, pointing out the capability of structures to gradually appear to take on a life of their own, developing with the passage of time some inertia that is not necessarily the result of human

intentions, and which human intentions cannot always alter (Humphrey, 1924; Silber, 1970; Jones, 1999; IDT Futures Group, 2002; Balconi *et al.*, 2004; Ritzer, 2007). This article goes beyond this 'either/or' mentality to investigate the complexity within the interactive relationships and operational dynamics between human and non-human factors (cf. Holland, 1966; Biglan, 1973).

3. Methodological Framework

Echoing the established conceptual framework, the article examines the following question: in what ways have scholars formed and been formed by the structural configurations of their academic domain? Answering such a question is challenging, considering that structural configurations cannot speak for themselves and report how they have and have not been formed by scholars. Likewise, scholars cannot easily identify the ways in which they have and have not been formed by structural configurations. As these are well-established configurations, their influence over humans tends to be taken for granted, and thus is difficult to see (Schütz, 1944). A worldwide collection of academics (99 authors) have collaborated to address the proposed question based on their reflections on daily social and academic practices. These authors were sought via online profiles and publications. Figure 1 illustrates that this collaboration took the form of three rounds during 2014–2015, and ultimately led to the publication of the present article.

Figure 1: The Iterative Crowd-Authoring Process (Al Lily, 2016)


Start
Round 1
The mediator (who is also 1st author) writes a short first draft of the article and then sends it to 2nd author.
2nd author adds to and comments on the draft and sends his/her input to the mediator.
The mediator negotiates with 2nd author on his/her input and develops a new draft based on this negotiation. This new draft is sent to the subsequent author.
Nth author adds to and comments on the draft received and then sends his/her input to the mediator.
The mediator negotiates with Nth author his/her input and develops a new draft based on this negotiation. This new draft is sent to the succeeding author.
The last author adds to and comments on the draft received and then sends his/her input to the mediator.
The mediator negotiates with the last author his/her input and develops a new draft based on this negotiation. This new draft is sent back to 2nd author, starting a new round
Round 2
2nd author adds to and comments on the draft received and sends his/her input to the mediator.
The mediator negotiates with 2nd author his/her input and develops a new draft based on this negotiation. This new draft is sent to the subsequent author.
Nth author adds to and comments on the draft received and then sends his/her input to the mediator.
The mediator negotiates with Nth author his/her input and develops a new draft based on this negotiation. This new draft is sent to the succeeding author.
The last author adds to and comments on the draft received and then send his/her input to the mediator.
The mediator negotiates with the last author his/her input and develops a new draft based on this negotiation. This draft acts as the basis for the next round.
Round 3
The mediator outlines the views written by the authors during Rounds 1 and 2. S/he designs a questionnaire consisting of these views. S/he asks the authors to complete this questionnaire to show which views they would agree or disagree with.
The mediator incorporates the results of the survey in the article. S/he sends the article to all the authors at once for approval.
Once the article is approved by the authors, and the mediator submits it for publication.
End

The first author acted as a mediator and negotiated the input of the 99 authors, creating 'crowd authoring' (Al Lily, 2016). He had the responsibility for merging and integrating the anonymous comments, and made the final decision about how to do so. At the very beginning of this project, the mediator wrote several paragraphs in which he critically reflected upon an issue, in line with the existing literature. These paragraphs were deliberately written to provoke and trigger ideological and intellectual conflict among the 99 authors. The mediator passed on these paragraphs to the other authors in three rounds, in the order illustrated in Figure 1. These authors sequentially made additions and comments. As these additions and comments were coming in, they were immediately subjected to a systematic analysis using an approach informed by the constructivist view of grounded theory (Glaser and Strauss, 1967; Mills *et al.*, 2006; Charmaz, 2014). As these accounts were coming in, the mediator was → generating codes from them → assembling codes of similar content to establish concepts → grouping similar concepts to create categories → assembling similar categories to generate a theoretical proposition. Figure 2 shows the final product of this analysis.

Figure 2: The Methodological Framework for the Analytical Process

Code →	Concept →	Category →	Theory
Continuity of structural arrangements due to the social support lent to them	**Scholars' formation of structural arrangements by making these arrangements *historically sustainable*** **A**	**Scholars' formation of structural arrangements**	**A mutually influential relationship between the human and non-human components of an academic domain, with the two shaping one another**
Continuity of structural arrangements due to the increasing number of associates			
Scholars' enhancement of academic diversity within structural arrangements	**Scholars' formation of structural arrangements by making these arrangements *diverse*** **B**		
Scholars' enhancement of geographical diversity within structural arrangements			
Transition of theoretical structural arrangements across time	**Structural arrangements' formation of scholars by the transition of these configurations across *time*** **X**	**Structural arrangements' formation of scholars**	
Transition of technical structural arrangements across time			
Transition of structural arrangements from one intellectual space to another	**Structural arrangements' formation of scholars by transition of these configurations across *space*** **Y**		
Transition of structural arrangements from one cultural space to another			

Moreover, a numerical aspect was added to the crowd-authored article. That is, after the second and third rounds, all the views expressed by the authors were outlined in a list. Then, a questionnaire setting out these views was designed. The authors were then asked to complete this questionnaire to show which views they would agree or disagree with. This made it possible to specify the percentage of the authors who would agree with a particular view. The

questionnaire was not used to carry out a true quantitative analysis, but was seen as a democratic means of conveying common views and achieving 'crowd-voting' (Howe, 2008). The results of this questionnaire are reported throughout the following section. Regarding demographic details, 20% of the authors are aged 30–39, 35% 40–49, 35% 50–59 and 10% 60 and above. The average amount of work experience in E&T is around 20 years. Figure 3 shows the locations of the authors, shaded in a darker colour.

Figure 3: Worldwide Locations of Authors

4. Findings and Discussions

This section takes in turn every code in Figure 2, summarising the related findings and discussing them in reference to the literature. Throughout this section, figures extracted from the main figure (i.e., Figure 2) are given, in which the code being discussed is highlighted (see the example in Figure 4).

4.1. Scholars' formation of structural arrangements

Figure 4: Current Location (*an extract from Figure 2***)**

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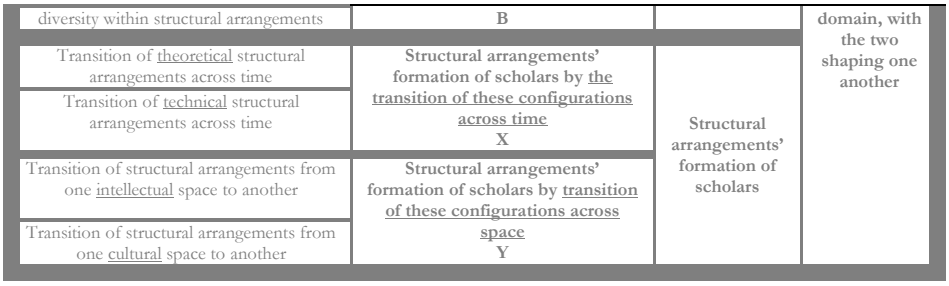
Code →	Concept →	Category →	Theory
Continuity of structural arrangements due to the social support lent to them	Scholars' formation of structural arrangements by making these arrangements historically sustainable	Scholars' formation of structural arrangements	A mutually influential relationship between the human and non-human components of an academic
Continuity of structural arrangements due to the increasing number of associates	A		
Scholars' enhancement of academic diversity within structural arrangements	Scholars' formation of structural arrangements by making these arrangements diverse		
Scholars' enhancement of geographical			



The code highlighted in Figure 4 demonstrates the continuity of structural arrangements due to the social support lent to them. 90% of the authors expressed the belief that the E&T academic domain had gained an improved status in some countries owing to the many academic and non-academic advocates who had constantly argued in favour of this domain and established its reputation. Useful writings in this respect are Hawkridge (1990), Capello (1999), Garris *et al.* (2002), Tondeur *et al.* (2007), Al Shae (2007) and de Freitas (2014). A point of agreement among 95% of the authors is that advocates in some regions have promoted the belief in E&T as the driving force in the 'transformation' (DeVillar *et al.*, 2013) of education and beyond, including workplaces, economy and wider society (Fisher, 2006). E&T has been, as argued by 95% of the authors, popularised in some countries through, and by, academic and non-academic articles, reports, policies, funding projects, movements, organisations and/or campaigns, made by individual and organisational efforts (Bates, 2008).

For 95% of the authors, promoters in some nations have established bodies of knowledge, rubrics, models, frameworks, journals, methods, research centres, associations, societies, offices, governmental agencies and/or open resources dedicated to E&T scholarship (Puntambekar, *et al.*, 2011; Bottino, 2013). 80% of the authors are in agreement that, in some areas, supporters have promoted E&T research as an inherently positive project, which has resulted in an optimistic rhetoric that is prevalent in research. Useful reads here are Cuban *et al.* (2001), Robertson (2003), Nivala (2009), Player-Koro (2012a) and Selwyn (2012). An understanding among 85% the authors is that commentators in some countries have anticipated further development in technology-based opportunities for education, which has helped with the marketing of the E&T academic domain. 85% of the authors reached a consensus that some E&T scholars' confidence with digital technology had made them more able to utilise social media to publicise their academic domain and to enhance its reputation (Priem *et al.*, 2012; Frey and Ebner, 2014). It may not be necessarily intended to promote or market the academic

domain, but activity on social networks (e.g., with hundreds of weekly education chats and thousands of education channels in use daily) promotes the academic domain.

65% of the article writers are of the view that the improved status of E&T in some countries has been partly the result of some academic and non-academic advocates constantly 'pushing' for the integration of technologies into education (Bigum, 1998), resulting in an unproductive process of 'reforming again, again and again' (Cuban, 1990: 3). E&T has, as 30% of the authors think, been over-advocated considering that the academic domain as a whole still does not have sophisticated methodological foundations and has been called 'methodologically limited' (Bulfin *et al.*, 2014: 403; Schön and Ebner, 2013). Moreover, believe 35% of the authors, E&T's findings are presented without rigorous evaluation, and/or their positive effect on learning is insufficiently verified or proved. And this perceived excessive use of technology in education does not necessarily help with learning but rather may result in negative cognitive and/or sociological consequences. The writings of Borgnakke (2007), Dunleavy *et al.* (2007), O'Donovan (2009), Carr (2010), Cifuentes *et al.* (2011), Goodwin (2011), Larkin (2011), Spitzer (2012), Tondeur *et al.* (2013) and Ertmer *et al.* (2014) constitute a valuable reading list in this regard.

Besides, 45% of the authors are of the opinion that the academic domain has suffered from shallow studies and findings with limited replication, partially because the constant evolution of technology has limited opportunities for longitudinal investigations (Adedokun-Shittu and Shittu, 2015). These authors judge that despite the effort of E&T advocates, there has been limited evidence of technologies resulting in a transformative educational experience. The exception is subject-specific technologies (see Lei and Zhao, 2007). Further arguments can be found in Kerimkulova (2010), Livingstone (2011), Kampylis *et al.* (2012), Player-Koro (2012b), Sapargaliyev (2012), Tarelli *et al.* (2012), Bocconi *et al.* (2013), Skolverket (2013), Yuan-Hsuan *et al.* (2013) and Player-Koro and Beach (in press). Half of the authors argue that some aspects of the prestige that the E&T academic domain has gained in some populations comes from the hope and ambition of its academics that many educational problems could be addressed using more technology and less human action. In summary, this intensive advocating activity, which has managed to cultivate E&T over a short period of time, has promoted its symbolic fruits by enhancing its social status and building a history for it. This activity has arguably been undertaken not necessarily by scholars but by other academic and non-academic actors (Kling *et al.*, 2003; Meyer, 2006).

Figure 5: Current Location (*an extract from Figure 2***)**

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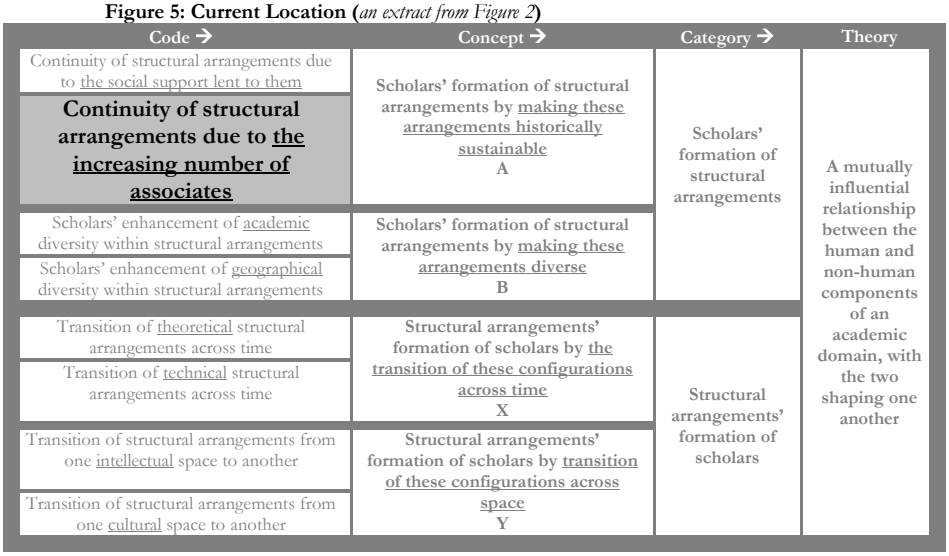


The code in Figure 5 refers to the continuity of structural arrangements due to the increasing number of associates. It is inspired by Whalley *et al.* (2011) and Chang *et al.* (2012). Various actors have joined the 'E&T ship', including educational scientists with a goal of developing and evaluating E&T. This is in addition to technology developers, typically with a computer science background, who focus on building novel tools. Forming another group of actors are subject-related teachers who are interested in using E&T rather than developing it further. Pedagogical experts who promote E&T in faculty training are relevant actors too. There are also academic or school leaders who want to promote the use of E&T in their institutes. Furthermore there are politicians who want to promote E&T because they believe educational problems can be solved with technology. Despite this labelling of these archetypes of E&T actors, the borders between them are blurred.

60% of the authors contend that, because of the mentality that the education profession is 'easy', many individuals have come from sectors other than education to this profession, thus increasing the number of its allies. 80% of the authors believe that some of these allies did their

undergraduate degrees in science, but for their postgraduate studies, they shifted to the E&T domain. These authors hold that, although some technologists did not originally focus on education, they have broadened their interests to E&T. For these authors, the belief is that, although some people used to specialise in an aspect of education that was not technologically focused, they have turned to E&T as a preferred academic profession, integrating a technological aspect into their educational research to join the E&T community. This increasing number of E&T associates is, as agreed by 65% of the authors, the result of the aura that the domain has gained. It is also, as remarked by 80% of the authors, due to the lives of individuals and wider society rotating around technology. Useful reads in this respect are Kumar and Vigil (2011) and Purcell *et al.* (2013). A belief held among these 80% of authors is that the potential of E&T to improve the different aspects of education has made some non-E&T educators shift their focus to E&T.

65% of the authors contend that some non-E&T educators have felt they now have no choice but to be part of the E&T domain as it is hard not to consider technology when talking about teaching or learning. These authors have confidence that the increasing number of E&T associates is driven partly by the rest of the education academic domains building on E&T for their innovations, thereby making more non-E&T educators turn to E&T. A claim by 55% of the authors is that some non-E&T researchers have joined the E&T domain and undertaken research projects in this academic domain mainly because technological development receives more funding. 45% of the authors say that, nowadays, in some countries, academics without interests and skills in E&T have a harder time getting university positions. The contention of 55% of the authors is that some non-E&T educators have turned to E&T because this enables them to remain educators while still becoming involved with the industry and business sectors through their interest in technology.

It is reasoned by 80% of the authors that the E&T domain has gained more allies as more sectors (governmental, private, academic and/or industrial) in some contexts have become interested in the various profits that it can generate and the costs (e.g., travel and office) it can mitigate (Slaughter and Rhoades, 2004). Half of the authors hold that E&T is an academic domain that helps make human life 'easy', and hence, is apt to be exploited as a business and therefore to become allied to the business sector. 75% of the authors are of the belief that the wider context (i.e., technologising culture) and/or the well-marketed role of E&T in the 'knowledge-based economy' have influenced the number of members joining the E&T domain.

90% of the authors have the opinion that policy-makers have become interested in E&T partly because of its role in the knowledge economy and/or international competition. Another common opinion, held by 75% of the authors, is that the increasing number of E&T members is partially due to the active employment market in some countries, in which more and more technology-based and innovative opportunities, roles and/or responsibilities have emerged (Fidalgo-Neto *et al.*, 2009).

85% of the authors have the attitude that, in some countries, companies and universities, often at the request of governments, have banded together to develop digital resources for schools (Aris *et al.*, 2006; Nurgaliyeva, 2010). 80% of the authors make the case that some funding opportunities ask for public–private partnerships, and E&T seems a suitable place to achieve this partnership, since E&T is about education (dominated by the public sector) and technology (dominated by the private sector). For 60% of the authors, the involvement of E&T with the industry or business sector raises the bar of prestige within the E&T academic domain and therefore enhances people's interest in joining this domain. 90% of the authors assert that some teachers, volunteers and communities have developed digital or open educational resources and have online platforms for teachers to share ideas and information on using technologies for innovative teaching and learning, thus increasing the number of allies in the E&T academic domain (Ebner *et al.*, 2014; Kostolanyova, 2014).

Figure 6: Current Location (*an extract from Figure 2***)**

Code →	Concept →	Category →	Theory
Continuity of structural arrangements due to the social support lent to them	Scholars' formation of structural arrangements by making these arrangements historically sustainable A	Scholars' formation of structural arrangements	A mutually influential relationship between the human and non-human components of an academic domain, with the two shaping one another
Continuity of structural arrangements due to the increasing number of associates			
YOU ARE HERE → **Scholars' enhancement of academic diversity within structural arrangements**	Scholars' formation of structural arrangements by making these arrangements diverse B		
Scholars' enhancement of geographical diversity within structural arrangements			
Transition of theoretical structural arrangements across time	Structural arrangements' formation of scholars by the transition of these configurations across time X	Structural arrangements' formation of scholars	
Transition of technical structural arrangements across time			
Transition of structural arrangements from one intellectual space to another	Structural arrangements' formation of scholars by transition of these configurations across space Y		
Transition of structural arrangements from one cultural space to another			

The code in Figure 6 refers to scholars' enhancement of academic diversity within structural arrangements. Most of the authors stressed the view that there are E&T associations more

connected to humanistic or social science fields, while other associations are more connected to science or technology fields. The majority of the authors speak of the boundaries that exist between the academic domain of E&T and that of computer science. Half of the authors refer to the confusion among some E&T scholars as to whether technology is part of the E&T academic domain or external to it. Most of the authors point out the borders that exist between *educational technology* programmes (i.e., the ones using technology to understand a subject) and *technology education* programmes (i.e., the ones teaching technology as a subject).

85% of the authors mention the boundaries that exist between the E&T academic domain and other educational academic domains, such as curricula and teaching methods, special education and/or educational administration and management (Karagiorgi and Charalambous, 2004). For 80% of the authors, the E&T academic domain has acted as an *academic* department (concerned with the production of theoretical knowledge) or as a *service* department (providing services to those who choose to apply technologies in their teaching and learning regardless of their academic discipline). 75% of the authors raise the point that there are E&T associations and societies that are more composed of E&T practitioners and technicians, whereas other associations and societies are more connected to E&T scholars and theorists (McKenney and Reeves, 2013; Ertmer *et al.*, 2015). In 95% of the authors' eyes, the E&T academic domain has been shaped by education-focused and technology-focused individuals. These authors state that E&T has branched into several sub-domains and communities with a variety of interests (Van den Akker, 2003). This is partly because scholars more strongly identify with their sub-domains than with the E&T academic domain as a whole; 55% of the authors propound this view.

The academic diversity of E&T associates could be seen as 'unity in diversity' and helps with the continuity of the E&T academic domain (Engeström *et al.*, 1999). Divisions have created silos with often competing interests, but bridges have been built between them. The E&T domain has, as it has argued earlier, received many members with different backgrounds and interests. 85% of the scholars welcome the influx of the different actors into the E&T academic domain given the different potential contributions that they can make to this domain. It seems to 65% of the authors that the entry of non-specialists and those from other disciplinary backgrounds have absolutely blurred the lines that set the academic domain apart from other academic domains and have enabled diverse definitions of the academic domain, which have resulted in many disparate E&T conferences, journals and organisations but no truly central gathering place. This, as remarked by 35% of the authors, may reflect unfavourably on its growth and evolution in

theory and/or practice. It may also lead to the loss of the identity of the academic domain, considering that becoming an academic domain with no defined identity and boundaries would reflect negatively on its acceptability in other academic domains and lead to loss of respect.

60% of the authors state that, as more people with different interests join the E&T domain, the domain becomes more politicised and fragmented (or specialised) by different interests. From its beginnings, E&T has often been led from the outside world, by consultants, inventors and entrepreneurs (Cuban, 1984). Flourishing variety in the academic domain, as 60% of the authors commented, creates difficulties in defining the 'expert' and core actors in the E&T academic domain and in identifying the skills needed for this domain. Related to this, 35% of the authors make the point that E&T has definitely turned out to be a technical field with a limited theoretical basis, not only because it is a new field, but also owing to those many 'out-of-field players' who have been introduced to the E&T field despite their limited knowledge of theoretical foundations.

However, according to 65% of the authors, the E&T academic domain is a field that should not and cannot have a fixed identity and clearly defined boundaries given its 'enriched' and progressive nature compared to 'old' and 'conservative' fields that cannot be renewed. A comment by 70% of the authors is that the E&T academic domain will remain well-respected with or without the fragmentation caused by the diversity of its actors, considering the role that technologies have played in teaching, learning and training. And 80% of the authors argue that people from different academic domains, interests and power joining the E&T domain can bring a holistic approach to the academic domain. 85% of the authors recommend that the intentional and critical use of technology for educational purposes in any academic domain be the binding force behind the coming together of various disciplines, resulting in a unique synergy in the interdisciplinary academic domain of E&T.

Figure 7: Current Location (*an extract from Figure 2***)**

YOU ARE HERE →

Code →	Concept →	Category →	Theory
Continuity of structural arrangements due to the social support lent to them	**Scholars' formation of structural arrangements by making these arrangements historically sustainable** **A**	**Scholars' formation of structural arrangements**	**A mutually influential relationship between the human and non-human components of an academic domain, with the two shaping one another**
Continuity of structural arrangements due to the increasing number of associates			
Scholars' enhancement of academic diversity within structural arrangements	**Scholars' formation of structural arrangements by making these arrangements diverse** **B**		
Scholars' enhancement of geographical diversity within structural arrangements			
Transition of theoretical structural	**Structural arrangements'**	**Structural**	

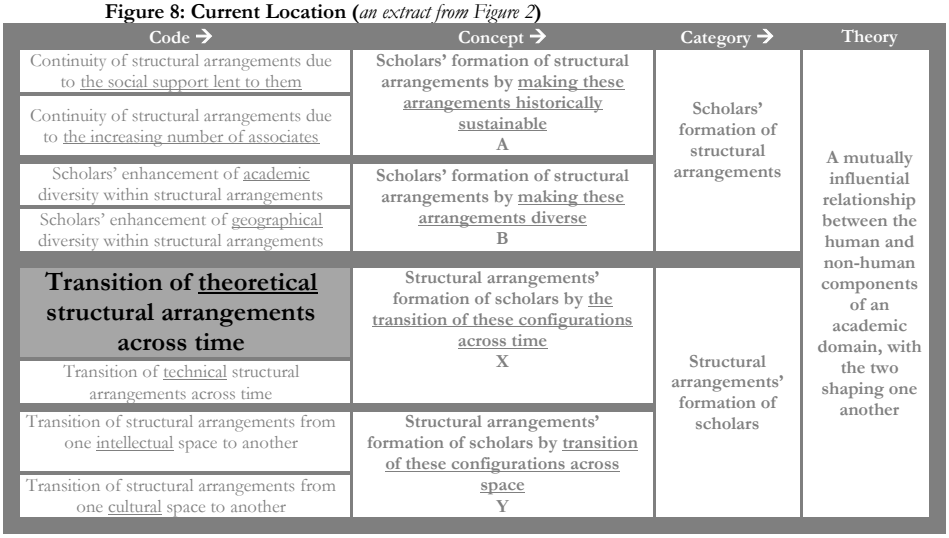
arrangements across time Transition of technical structural arrangements across time	**formation of scholars by the transition of these configurations across time X**	**arrangements' formation of scholars**	
Transition of structural arrangements from one intellectual space to another Transition of structural arrangements from one cultural space to another	**Structural arrangements' formation of scholars by transition of these configurations across space Y**		

The code in Figure 7 relates to scholars' enhancement of geographical diversity within structural arrangements, whether at local, national or international levels. Some E&T scholars in certain regions have assembled to establish their own region-specific organisational arrangements, be they associations, societies, offices, journals, conferences, seminars, definitions, or standards. Others have gone further, collaborating to form international arrangements (Bottino *et al.,* 2009). A reason for such organisational collectivism is, as reported by 70% of the authors, the power of technology-based global communication. This is in addition to, as agreed by 85% of the authors, the benefit of representing members, forming relationships between them, and validating or providing recognition for one's efforts (Buarki, 2015). A further reason, echoing the theory of regionalism (Fawcett and Hurrell, 1995), is a realisation on the part of their leaders that region-based entities (societies or associations) often cannot gain sufficient recognition and influence at the international level (65% of the authors agree). An additional reason is that science or social science is, almost by definition, international. However, from the standpoint of 45% of the authors, a risk or ramification of such coalitions is that regional identities have certainly been sacrificed in order to pursue and obtain international status and legislative influence.

For 90% of the authors, affiliation with regional groups has occurred because it has functioned as a mechanism for contributing to the growth of the academic domain, enhancing professional discussion, encouraging intellectual exchange, creating new knowledge, and/or allowing technologies and experiences to extend beyond local boundaries (Bottino, 2007). A further argument made by 55% of the authors is that education *per se* is surely regional, being associated with a particular language and culture, thereby bringing about region-specific arrangements for E&T (Krug and Arntzen, 2010). Due to developments of the academic domain, it is important for 80% of the authors to provide a nexus for the wide variety of programmes, initiatives and organisations that are active in this academic domain. E&T academics in developing countries are, as reported by 55% of the article contributors, the ones who particularly benefit from membership in and association with international organisations and societies, since developed countries are involved with these arrangements and therefore bring more advantages.

4.2. Structural arrangements' formation of scholars

Figure 8: Current Location (*an extract from Figure 2***)**



The code in Figure 8 concerns the transition of theoretical structural arrangements across time. Some of the locally and internationally established E&T arrangements have promoted a sense of centralised academic authority that codifies terminology, reduces confusion, settles conflicts, and defines basic qualifications, roles, responsibilities, and desired ethical standards of experts and areas in relation to E&T expertise (see, for example, the Definitions and Terminology Committee of the Association for Educational Communications and Technology). This has contributed to the structural configuration and bureaucratisation (or, rather, to professionalisation) of E&T expertise, particularly in developing countries. As an academic domain becomes configured structurally, these configurations become increasingly rigid, taken for granted, and difficult to change or question. These configurations limit flexibility and cause the scholar to 'run' after specific types of recognition, which restricts creativity. This shows how the shifts in structural arrangements of an academic domain over time can shape scholars.

As the structural arrangements of the E&T academic domain grow larger and involve more and more literature, theories, specialised scholars, advocates, funding projects, logistical systems and

other equipment, they are likely to turn out more to be shaping scholars and less to be shaped by them (Hughes, 2009). It seems that the greater the structural stretching of the E&T academic domain across time and space, the more resistant it is to manipulation or change by any individual scholar (Giddens, 1984). 75% of the authors concur that, as the E&T academic domain becomes configured structurally, these structural configurations gradually frame the work of subsequent generations. 60% of the authors remark that, in an area such as E&T, it is difficult to transfer structural configurations from one generation to another because of the rapid changes due to the nature of this academic domain, which is associated with technology. 55% of the article writers, however, argue that there has actually been a sense of historical continuity regarding the E&T literature because of the well-established structure and infrastructure of higher education, wherein technologies have been developed merely *within* traditional practices. Collis and van der Wende (2002), Duderstadt *et al.* (2002) and Sife *et al.* (2007) expand this argument. It is important for 80% of the authors that the configurations of the E&T academic domain are sustained across time because building upon prior work lends stability and validity. Yet some may respond that stability is unhealthy in academia, where intellectual uncertainty and cognitive unrest should always be encouraged.

In the opinions of 80% of the authors, many E&T scholars have continued using certain theoretical notions and approaches, despite the changes caused by technology, reforms, funding projects and/or advancement of academic research. A similar case has been made by Maddux (1986), Mellon (1996), Molnar (1997), Schifter (2008) and Romero *et al.* (2014). Many E&T journals and other publication venues have arguably been 'factories' (i.e., tools) for the reproduction of many academic values and beliefs. This is a problematic issue for such a relatively young academic domain as E&T. This is challenging given the unclear distinction between what is 'merely building on earlier works' and what is 'a cumulative nature of making science at its best'. Some may remark that much of the E&T research involves empirical methods, and theories in education can only grow stronger with accumulating empirical evidence, which calls for a certain degree of repetition or replication. Thus, this repetition is not the fault of academics but is an unavoidable consequence of the academic domain's nature. This is an example of how academic domains and their nature can exert influence on academics and their academic behaviour.

It is a belief among 90% of the authors that many E&T scholars have been influenced by the values, perspectives, behaviours and decisions of earlier scholars. In this light, the E&T academic

domain should not be seen simply as an assembly of theories and findings, but rather as a means of building up a contextual framework within which current and future generations act and react. A perspective held by 85% of the authors is that academic attitudes and values are transmitted to E&T academics through the academic environment they evolve in, wherein they grow from the past and existing academic configurations of their academic domain and wider academia. 70% of the authors agree that the E&T academic domain has created a 'hat' or a 'mask' that its scholars wear, has established a language that they speak, and has developed a theoretical and conceptual 'lens' through which they approach their work in the academic domain. Such a view can be read about in Price and Maushak (2000), Edyburn (2001), Solomon (2002), Niederhauser *et al.* (2005) and Adedokun-Shittu and Shittu (2013). Since the structural configurations of academic domains have the capacity to frame academic and social actions, E&T scholars have performed *within* the context and potential of the available structural configurations. Besides, a perception held by 60% of the authors is that, while every human being (here, the E&T scholar) is unprecedented, unique and unrepeatable, by virtue of their genetic constitution and past experiences, the structural configurations of their academic environment determine at any given moment which of their academic potentialities are realised in their life (Dubos, 1970). As opined by 65% of the authors, while the structural arrangements of the E&T academic domain have not been self-creating, but have essentially been created by human beings (e.g., scholars), their creators have not afterwards had full freedom to decide how they develop. It is difficult for 80% of the authors to keep the structural norms of academic domains under social control once they have become far reaching, especially in the case of an academic domain such as E&T, which is not a very clearly defined field, has many sub-fields and is associated with the influx of technologies.

A point of view expressed by 65% of the authors is that the E&T academic domain will certainly not simply evaporate if its models and structures are no longer in line with the demands of society (i.e., the educational system); if a society no longer wants E&T, another society will continue to do so. Besides, not all cultures are able to adopt all innovations (theoretical and instrumental) at the same moment, and some types of novelties need time to become part of daily 'tools' to achieve objectives and develop strategies (Mazzoni, 2006; Perret and Mazzoni, 2006). For 55% of the authors, the human mind (here, the mind of the E&T scholar) sometimes becomes unable to manage what it has initially created; consequently, the same (theoretical and conceptual) structural frameworks that have extended humans' control over the world are themselves difficult to control, question and fight against (Winner, 1977). There appears to be a risk, therefore, of E&T scholars becoming the servants in thought, as in action, of the theories

they have been created to serve them (Galbraith, 1967). Hence, one might emphasise the importance of ensuring that theoretical structures always remain the servants of humans instead of their masters and, moreover, that theories are not allowed to subvert the rule of their masters.

The human–theory relationship (here, the relationship between E&T scholars and the theoretical structural configurations of their academic domain) seems to half of the authors extraordinary, with the theory framing a task that is beyond a human's strength and capability of endurance, while the human watches over those aspects of the work that are beyond the theory's processing powers. For 70% of the authors, there can be an unbalanced relationship between scholars and the structural arrangements of their academic domain, in that scholars may form their fields by establishing their configurations and parameters, but the fields may form the scholars, as their configurations and parameters may evolve across time and therefore frame the thoughts of following generations. This evolution across time might not yet be quite the case with the E&T academic domain, considering its 'novelty', but may be the case in the future. Yet novelty is a dynamic force in the academic domain and is a major influencer in its development, and therefore the academic domain would constantly remain novel. But novelty comes from scholars who must have the freedom to act and bring new ideas to the academic domain in a conscious way. This freedom has been mostly dysfunctional, and one need only look to the E&T academic domain and its dependence on practice reified from the 1950s to the 1970s by Kirkpatrick (1959), Gagne *et al.* (1974) and Dick *et al.* (1978) to see an example of an academic domain held hostage by the past.

Figure 9: Current Location (*an extract from Figure 2***)**

	Code →	Concept →	Category →	Theory
	Continuity of structural arrangements due to the social support lent to them	**Scholars' formation of structural arrangements by making these arrangements historically sustainable** **A**	**Scholars' formation of structural arrangements**	**A mutually influential relationship between the human and non-human components of an academic domain, with the two shaping one another**
	Continuity of structural arrangements due to the increasing number of associates			
	Scholars' enhancement of academic diversity within structural arrangements	**Scholars' formation of structural arrangements by making these arrangements diverse** **B**		
	Scholars' enhancement of geographical diversity within structural arrangements			
	Transition of theoretical structural arrangements across time	**Structural arrangements' formation of scholars by the transition of these configurations across time** **X**	**Structural arrangements' formation of scholars**	
YOU ARE HERE →	**Transition of technical structural arrangements across time**			
	Transition of structural arrangements from one intellectual space to another	**Structural arrangements' formation of scholars by transition of these configurations across space** **Y**		
	Transition of structural arrangements from one cultural space to another			

The code in Figure 9 is about the transition of technical structural arrangements across time. Earlier scholars engaged in three paradigms: *experimentation*, which was used for *theorisation*, which was then used in turn for *computation*. Such computation seems to have a life of its own, growing into a fourth paradigm (i.e., observational data) and producing an overwhelming flow of data (Baker, 2014). It has been proposed that 'the only way to cope with this flow of data is a new generation of scientific computing tools to manage, visualise and analyse the data flood' (Markoff, *The New York Times*, 14 December 2009). Following this line of thinking, computing tools can be handled only by other computing tools, and humans (with the possible exception of some scholars) may be out of the loop. A very extreme position is that scholars may have served their academic domain in the form of supporting it with computing tools, but their academic domains have ended up dominating and controlling their behaviour and actions and encouraging or moreover forcing them to generate more computing tools, which then appear to have a life of their own (Weizenbaum, 1976; Berker *et al.*, 2005). For 85% of the authors, in the last century the concern was whether to use technology for education; nowadays, education has no option but to take advantage of the potential of technology (Bowen, 2012). In this case, E&T has made a history for itself, going beyond human agency (Baiocco *et al.*, 2015).

An observation by 70% of the authors is that once some scholars hear of the release of a non-educational technology, they start acting responsively in relation to it by examining merely its *implications* for education. This means that existing technologies (i.e., existing structural configurations) direct the scholarly activity of E&T scholars, although these scholars should be the ones directing technological development by grounding new theories based on which technological innovations are established. In other words, the socio-technical system that E&T deals with should be defined and driven from the social side, not vice versa. In this case, the academic domain will be (and has sometimes been characterised as being) a matter of solutions seeking problems. Yet one may wonder if it is possible to conceive of a 'scholar' outside a technologically determined and structured context. A further argument is that human-structured systems should be driven by either social or structural factors, but that the social and the structural elements should be co-creators (Bottino *et al.*, 1999). For 90% of the authors, some E&T scholars are associated with the technical (i.e., structural) configurations of their academic domain, to the extent that they can be 'out-of-date' if their academic interest is essentially based on a particular technology that has been replaced by a completely different technology, and if the academic transition of these scholars from the early to later technologies is difficult. 65% of the authors hold that moving from one technology to another can force academics to change many

of their beliefs and philosophical standpoints if each technology preserves its own philosophical patterns.

60% of the authors believe that many E&T terms (i.e., terminological structures) have survived for decades and moved from one generation to another, although any carefully made attempt to question these terms would easily reveal their terminological limitations. This belief is further discussed in Heinich (1984), Loveless and Dore (2002), Sangrà *et al.* (2012) and Richey (2013). Some subsequent academics have taken many E&T terminological structures for granted without rationalising and challenging them and examining their ramifications. The previous generations should not be the only ones to be criticised for conveying arbitrary terminological structures to the current generation, since the current generation has chosen to maintain these terms and perpetuate uninformed terms, e.g., 'e-learning 2.0' and 'school 2.0' (Sbihi, 2009; Sbihi and El Kadiri, 2010). Such terminology has resulted in elaborate phrases, such as 'E-Learning 3.0 = E-Learning 2.0 + Web 3.0?' (Ebner, 2007; Hussain, 2012). Subjecting terminology to a sequential order and chain (e.g., e-learning 2.0, then e-learning 3.0 and so on, or education 2.0, then education 3.0 and so on) could be interpreted as a means of promoting and temporally assigning technical configurations and terminologies, but also can be perceived as evolving stages of the use of technology features in educational settings. It could also be understood as a way of encouraging following generations to join this chain and to take what has been inherited forward (Keats and Schmidt, 2007; Gerstein, 2014). This suggests the power of terminological structures as a means of enabling historical continuity of the E&T academic domain's arrangements (Heeks, 2010; Thompson, 2013), although some recognise that terminology is dynamic and therefore changes over time.

Figure 10: Current Location (*an extract from Figure 2***)**

Code →	Concept →	Category →	Theory
Continuity of structural arrangements due to the social support lent to them	Scholars' formation of structural arrangements by making these arrangements historically sustainable A	Scholars' formation of structural arrangements	A mutually influential relationship between the human and non-human components of an academic domain, with the two shaping one another
Continuity of structural arrangements due to the increasing number of associates			
Scholars' enhancement of academic diversity within structural arrangements	Scholars' formation of structural arrangements by making these arrangements diverse B		
Scholars' enhancement of geographical diversity within structural arrangements			
Transition of theoretical structural arrangements across time	Structural arrangements' formation of scholars by the transition of these configurations across time X	Structural arrangements' formation of scholars	
Transition of technical structural arrangements across time			
Transition of structural arrangements from one intellectual space to another	Structural arrangements' formation of scholars by transition of these configurations across space Y		

YOU ARE HERE →

Transition of structural arrangements from one cultural space to another			

The code in Figure 10 is about the transition of structural arrangements from one intellectual space to another. 85% of the authors observe that some of the configurations used in non-E&T academic domains (i.e., intellectual spaces) have been transferred to the E&T domain (i.e., another intellectual space), influencing the thoughts of E&T scholars. For 90% of the writers, many macro concepts, notions and theories (i.e., structural configurations) have come to the E&T academic domain from other domains. 61% of the authors speak of the limited 'in-house' macro theories set out by the E&T academic community specifically for E&T. That said, some may argue that E&T academics have used grounded theory to inductively ground theories. Yet although E&T academics claim that they have grounded a theory inductively from their own data, this grounding activity normally exists *within* the pre-established theoretical conceptions of other academic domains, and in addition they generate merely micro theories. Higher education in some countries does not establish departmental boundaries between the E&T academic domain and other educational domains (e.g., curricula and teaching methods, teacher education, special education, and educational administration and management), thus easing the transmission of foreign theoretical structures to the E&T academic domain (Karagiorgi and Charalambous, 2004).

81% of the authors state that English-speaking scholars (be they native or non-native but fluent) have constituted an intellectual space with its own structural arrangements, which have influenced the intellectual spaces of researchers who are not fluent speakers (Freire, 2000). For 70% of the article writers, English speakers tend to be symbolic leaders in the E&T academic domain while many non-English-speaking scholars have sought to gain legitimacy, credibility, prestige or success by following them. This means that the structural configurations of the E&T academic domain have moved from one intellectual space (here, the space of English speakers) to another, shaping its scholars and moreover its configurations. Due to the global domination of the structural configurations of the E&T academic domain by the English-speaking intellectual space, local structural configurations in the intellectual spaces of those who are not proficient writers of English tend to be overlooked and dominated.

Figure 11: Current Location (*an extract from Figure 2*)

Code →	Concept →	Category →	Theory
Continuity of structural arrangements due to the social support lent to them	Scholars' formation of structural arrangements by making these arrangements historically sustainable A	Scholars' formation of structural arrangements	A mutually influential relationship between the human and non-human components of an academic domain, with the two shaping one another
Continuity of structural arrangements due to the increasing number of associates			
Scholars' enhancement of academic diversity within structural arrangements	Scholars' formation of structural arrangements by making these arrangements diverse B		
Scholars' enhancement of geographical diversity within structural arrangements			
Transition of theoretical structural arrangements across time	Structural arrangements' formation of scholars by the transition of these configurations across time X	Structural arrangements' formation of scholars	
Transition of technical structural arrangements across time			
Transition of structural arrangements from one intellectual space to another	Structural arrangements' formation of scholars by transition of these configurations across space Y		
Transition of structural arrangements from one cultural space to another			

YOU ARE HERE →

The code in Figure 11 refers to the transition of structural arrangements from one cultural space to another. 55% of the authors consider the E&T academic domain to have undergone a 'core-periphery' dichotomy (Wallerstein, 1974), with feedback between the core and periphery. The core here indicates the cultural space of *native* English-speaking countries, and the periphery refers to cultural spaces of other countries (Rowley and Warner, 2011). 70% of the authors state that the E&T structural configurations of native English-speaking countries have taken advantage of globalisation through the (intentional or unintentional) domination of other cultures' E&T structural configurations. Despite this, some non-English-speaking countries are, as remarked by 80% of the authors, attempting to reach and influence the core, for example by funding projects, by benefiting from outstanding scholars worldwide, by hosting academic events and/or by collectively publishing in English (Zervas *et al.*, 2014). With such attempts, the English-speaking core might eventually move to the periphery (Westerberg, 2014). There is a need to be inclusive of a broader worldview, especially considering that the core–periphery structure is not static and would be expected to change. It may be in the best interests of native English speakers to promote that worldview before they become irrelevant. The structural

configurations of cultural spaces appear to have a life of their own, seeking to replace and shape the structural features of one another away from explicit human agency.

According to 60% of the authors, many E&T researchers in developing countries have sought sponsorships from English-speaking countries. This is when English-speaking domination comes into play, since sponsorships come with ideological and political biases (Ashraf, 2008; Adedokun-Shittu, 2014). Half of the authors note that, while the English-speaking domain of E&T dominates other domains, it does not actively seek to do so. That is, there have been indirect factors (e.g., having better funding) that have occasioned domination. Hence, one may dispute the general assumption that, as a speaker of English as a first language, one is always advantaged by this dominance of English; it may be instead a source of frustration. The English E&T scholar Selwyn (2013) agrees with McMillin (2007) that such a 'core–periphery' dichotomy 'is a growing source of embarrassment' (McMillin, 2007: 9) for some scholars in the core. The structural configurations of a cultural space may not only colonise those configurations of another cultural space and frustrate its scholars, but moreover may colonise its own scholars. This then supports the 'agency' of non-human elements and the power of structural configurations to shape scholars.

80% of the authors have noticed that, in non-English-speaking countries, many scholarly studies have researched E&T using structural configurations and frameworks from English-speaking countries, despite the cultural differences between the two contexts (Farrell, 2000; Ashraf *et al.*, 2008; Bardakci, 2013; Adedokun-Shittu and Shittu, 2014). 55% of the writers think that many studies of non-English-speaking contexts strive to confirm the studies of native English-speaking contexts rather than independently exploring their own contexts. Some may argue against this point, explaining that, in non-English-speaking countries, exploration is also a main component of academic research, but the reason that only the confirmation of research gets heard may be that only the confirmation can get accepted in international (i.e., English-speaking) journals. 75% of the authors state that some non-English-speaking countries have their own structural configurations (e.g., traditions, theories, experiences, lessons learnt and frameworks of E&T), which have not been translated into English and distributed globally and therefore have not had the chance to influence the core. Only those non-English-speaking structural configurations that the English-speaking world has decided to translate have therefore become popular and become part of the core, yet in their English version (half of the authors agree). One may remark that the dominance of certain structural configurations over others is not based on language issues (or, at

least, language issues alone) but based on resources and historical inequality. It is a matter of opportunity, voice and power. Thus, the transferability of E&T structural configurations across space is a matter of politics.

5. Concluding Remarks

This article has been guided by the conceptual framework wherein academic domains are viewed as loose entities whose human elements (here, scholars) and non-human elements (here, structural configurations) collaborate with or compete against one another to shape the identity of the academic domain. Based on this framework, the article has examined the functional relationship between scholars and structural configurations, using the academic domain of E&T as a case study. A worldwide collection of academics (99 authors) have been collaboratively engaged to look into this relationship based on their reflections on daily academic practices. Analysis of these scholars' reflective accounts was conducted, and a theoretical proposition has been established from this analysis. The proposition is that there exists a mutual (yet not necessarily balanced) relationship of power (which is therefore political) between the scholars and structural configurations of academic domains. That there is a tension between the individual and the collective in general is well-established (Ritzer, 2013), but what is emphasised here is the political perspective (Kullmann, 1991). This grounded proposition is a conclusion but more importantly a starting point for further research wherein different academic domains are investigated using this proposition.

It seems from the collected data that scholars choose to transfer their political and intellectual powers into structural configurations, which then exercise this power over these scholars. These scholars may then either challenge or acquiesce to this power, on an iterative basis (Amsterdamska, 1990; Unger, 2004). In other words, although scholars contribute to the development of structural configurations, the developed configurations grow and gain spatial strength and temporal value that shape scholars; yet the trend reverses as the eminence achieved by scholars starts to shape and develop the structural configurations of the academic domain, although the developed components, again, continue to grow and shape scholars. This process occurs in a continuous loop. The chance of contributing to an academic domain is significantly higher during the creation process, compared to a later stage where fundamentals are defined and where foundations are well-established. Changes are discouraged by these defined

fundamentals and well-established foundations, requiring stronger arguments and incentives to include new or different opinions.

Structural components get politicised by scholars to various degrees, but scholars also get politicised by structural components to various degrees. This activity of politicisation can be done silently or explicitly, for positive or negative reasons, and in healthy or unhealthy, ethical or unethical ways. At times, existing structural components go along with and can be 'tamed' by scholars, but at other times, they go beyond, above and against their intentions. Structural components could evolve into creatures unto themselves, existing as executive bodies that scholars merely *represent* – acting as merely a representative of something means limited exercise of one's own agency. Although scholars may show no interest in 'organisational politics' (i.e., competition for space, authority, power and leadership; Jones, 1987), they may, whether intentionally or naturally, consciously or unconsciously, exercise it as part of their daily social engagement with their academic domain (Morgan *et al.*, 1997). This article has shown how scholars may (and should) compete against the structural configurations of their academic domain for space, authority, power and leadership. It is a matter of what – human or non-human components – is doing the shaping, and who is being shaped.

There is a possibility that organisational politics may take an interest in scholars, who could become merely 'objects' politicised by, and therefore function according to, the structural configurations of their academic domains (Latour, 2005; Silverstone *et al.*, 1992; Whittle and Spicer, 2008). Although the actions of individual scholars are taken in reference to the macro structure of their academic domain, these actions may or may not cause changes in the structure (Giddens, 1984; Coleman, 1986; Lave and Wenger, 1991). Scholars should be conscious of this political relationship with the structural configurations of their academic domains, and hence should always keep pushing the frontiers of academic domains, while limiting and continuously challenging the domination and control imposed by these configurations over them. This domination and control could be overcome by continuously problematising structural parameters. A political and cognitive 'battle' between scholars and the structural norms of their academic domains should be cultivated. This relationship between these two components, as well as other relationships that were realised throughout the research for this article, is illustrated in Figure 12.

Figure 12: Theoretical Proposition on the Relationship between the Human and Non-Human Components of an Academic Domain

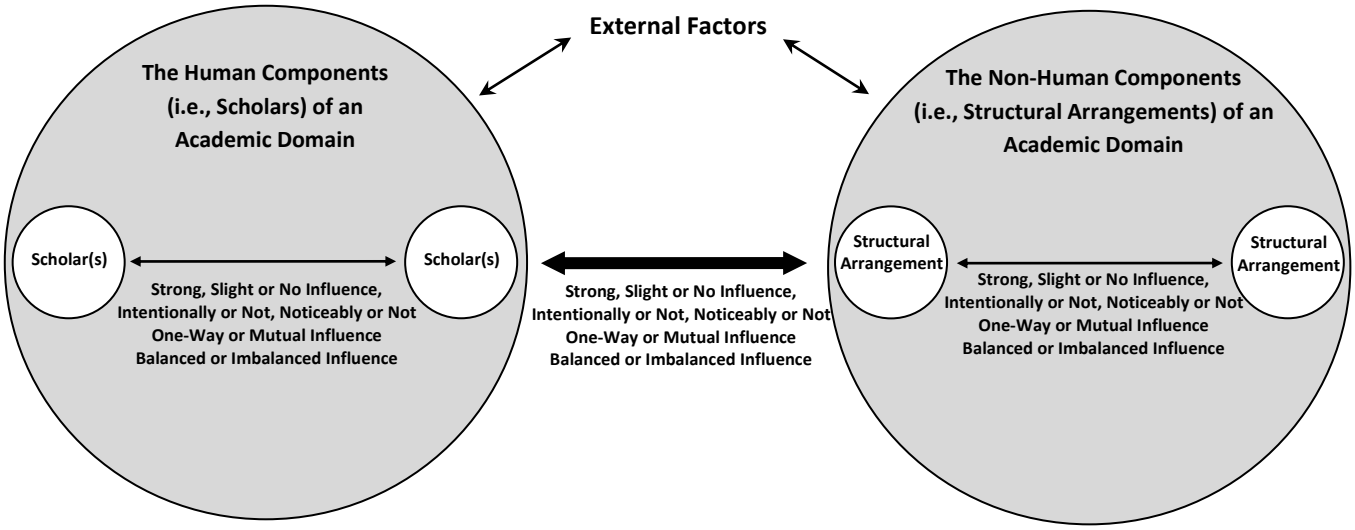


Figure 12 shows the limitations of the current article: although it addresses the relationship between the human and non-human elements of an academic domain, it does not explicitly cover other forms of relationships among human elements themselves, among non-human elements themselves and between the internal components of an academic domain and external components. To conclude, the current work has implications for theory development (i.e., that the non-human elements of an academic domain are 'actors', just like human elements, having 'agency' that they exercise over humans) and moreover for practice (i.e., that crowd-authorship is expected to produce advances within E&T scholarship and scholarship in other fields, compared with authorship approaches found in the typical model of scholarly publishing).

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