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David Sammon

Tadhg Nagle

Paidi O'Raghallaigh

Patrick Finnegan

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DESIGN OF A PEDAGOGICAL ARTEFACT FOR DOCTORAL RESEARCHERS TO ASSESS THEORETICAL STRENGTH

Sammon, David, Business Information Systems, University College Cork, Cork, Ireland,
dsammon@afis.ucc.ie

Nagle, Tadhg, Business Information Systems, University College Cork, Cork, Ireland,
t.nagle@ucc.ie

O'Raghallaigh, Páidí, Business Information Systems, University College Cork, Cork, Ireland,
paidioreilly@gmail.com

Finnegan, Patrick, Information Systems, Technology and Management, Australian School of
Business, University of New South Wales, p.finnegan@unsw.edu.au

Abstract

Making a theoretical contribution can be viewed as one of the most important and confusing objectives for a doctoral researcher. Focusing on the literature review process, this paper highlights the need to develop a pedagogical artefact that will enable a new doctoral researcher to assess the theoretical strength of the literature they survey and review, while also facilitating the development of a concept-centric matrix for their chosen research topic. In this paper we present a conceptual data model design underpinning the structure of our proposed pedagogical artifact. We support new doctoral researchers through promoting a two step literature review process of [1] categorising the literature and [2] developing a theoretical framework to guide making a theoretical contribution. The artefact's conceptual data model design captures the most important aspects that demand the attention of a new doctoral researcher.

Keywords: Pedagogical Artefact, Literature Review, Theoretical Strength, Doctoral Research, Theoretical Contribution.

1 Introduction and Motivation

In this paper we argue that there is a need to focus on simplifying the research process for new doctoral researchers. While this argument is not an *easy sell* amongst senior Information Systems (IS) scholars, based on our experiences in discussions, it is accepted and supported by new doctoral researchers themselves when presented with the underlying value of our proposed pedagogical artefact. In no way does the pedagogical artefact, the conceptual data model design for which is presented in this paper, remove the need for hard work and sustained effort on behalf of new doctoral researchers, instead it formalises a way of thinking and presents a way of organising and categorising the literature surveyed and reviewed. Specifically, as past research is the foundation from which new theory is developed; the literature review becomes a key bridging point to new knowledge. Yet, the lack of practical experience among new doctoral researchers can lead to a failure on their behalf to identify and internalise the theoretical strength of the literature they survey. This results in a less than stable foundation from which new doctoral researchers can develop a theoretical framework to structure their thoughts which will further guide them in how best they can make a contribution to the scientific body of knowledge (make a theoretical contribution). As a result, we present the conceptual data model design for a pedagogical artefact that caters for the IS domain's specific characteristics and aims to offset this lack of practical experience among new doctoral researchers. The key aim is to:

improve researchers' theoretical analysis skills, and enable researchers to assess the theoretical strength of the literature they survey and review, while aiding researchers better understand and shape the theoretical landscape of their domain.

From a wide perspective, authors such as Weick (1989), Whetten (1989) and Sutton and Staw (1995) provide good foundations for new researchers on how to develop strong theoretical contributions. In particular, Colquitt and Zapata-Phelan (2007) surveyed a large sample of Academy of Management articles, which resulted in the development of a taxonomy of theoretical contributions. As well as providing a useful guide into different types of contributions, the taxonomy is also split into low and high level contributions. This is important for a number of reasons:

- enables researchers to appreciate the wide variety of theoretical contributions that can be made, and
- highlights the varying strength of contributions within domains, which can ultimately categorise the domain (Arnott and Pervan, 2008).

To a limited degree the Colquitt and Zapata-Phelan (2007) taxonomy of theoretical contributions provides a useful guide to new doctoral researchers. However, we argue that they do not examine the theoretical strength of the research articles directly nor do they suggest a method of how to do so. Therefore, embracing the thinking of Colquitt & Zapata-Phelan (2007), the question must be raised: *how can a new doctoral researcher appreciate what a theoretical contribution is and ensure that the literature they review and build their own conceptualisations and frameworks on is theoretically strong?*

Like all new researchers, doctoral researchers strive to master the practicalities of carrying out research while also contending with the 'big puzzle' of how to make a theoretical contribution to the scientific body of knowledge. Therefore, through simplifying the research process the pedagogical artefact will aid new doctoral researchers to assess the theoretical strength of the literature they survey and review. By identifying the theoretical components that are lacking from this literature they can highlight potential opportunities to develop a stronger theoretical contribution. Moreover, this simplification should reduce the learning curve that new doctoral researchers face and reduce the time and resources needed to make a theoretical contribution. Our proposed pedagogical artefact embraces both research-based and research-informed teaching and learning. Our proposed artefact encourages self-reflexivity (the critical appraisal of ones own assessment) which is becoming increasingly recognised as a crucial aspect of research practice. Therefore, researchers using our artefact to assess

the theoretical strength of the literature they survey and review are themselves beginning the process of reflexivity at the beginning of their research journey.

Within the IS domain it is now time to offer some guidance to researchers, especially new doctoral researchers, while also maintaining focus on the centrality of the literature review in the doctoral research process. The remainder of this paper is structured as follows. The next section comments on the identity and legitimacy in IS research while also presenting an insight into the doctoral research process and the centrality of the literature review. This is followed by the presentation of the design of the theoretical strength (pedagogical) artefact, in the shape of a conceptual data model. The paper concludes with some discussions and conclusions.

2 Identity and Legitimacy in IS Research

Issues of identity and legitimacy are important in all academic fields, including the IS field. The strengthening of identity and legitimacy among stakeholders is a mark of a field's growing maturity (King and Lyytinen, 2006). However, the nascent IS field demonstrates continued insecurity regarding its identity and legitimacy and there is significant disagreement on how concerned we ought to be and what, if anything, we should do about these concerns. Some authorities (e.g. Benbasat and Zmud, 2003; Hirschheim and Klein, 2003) suggest that the IS field is in danger of disappearing if the concerns are not addressed aggressively. Others (e.g. Galliers 2003) are less concerned suggesting that these concerns are not really worthy of undue concern. When it comes to suggesting a solution there are also contrasting views. At one end of the scale are those who believe that identity and legitimacy go hand in hand with a sustained intellectual focus. The identity of successful academic fields among their peers is built around strong theories at their epistemic cores (Bakshi and Krishna, 2007; Benbasat and Zmud, 2003; King and Lyytinen, 2006; Weber 2003; 2006). For example, Weber (2003 p. vi) states that "*the identity of a discipline is established through the contributions it makes to theory. The core phenomena of the discipline are circumscribed via the theories 'owned' by the discipline that account for these phenomena*". Toward the other end are those who argue that a fluid identity embracing "*multiplicity of intellectual perspectives ... is the only realistic way of hitting all the important research targets and reaching legitimacy*" (King and Lyytinen, 2006, p. 350), but there is disagreement about the relationship between identity and legitimacy. Benbasat and Zmud (2003 p. 185) argue that "*[i]f influential stakeholders are unable to comprehend the nature, importance, and distinctiveness of the IS discipline, these stakeholders are unlikely to acknowledge its legitimacy within the organizational field*". While many agree, others such as Weber (2003; 2006) contend that a *clear disciplinary identity* is neither a necessary nor sufficient condition for academic legitimacy. There is no evidence to suggest that the creation of theory makes legitimate a field that lacks legitimacy (Lyytinen and King, 2004).

While arguments continue into the attainment of identity and legitimacy, it is almost impossible to find anyone in the debate who argues that theory is unimportant, or that strengthening the field's principal theories is undesirable. Instead there appears to be "*broad agreement on the general value of theory, per se*" as it can enhance the field's cognitive or pragmatic legitimacy (King and Lyytinen, 2006, p. 349). In other words while it may be impossible to conclude that theory is equated with legitimacy it is at least contributory to the legitimacy of the field among its internal and external stakeholders. But this legitimacy depends on the *social salience* of the topics studied as well as the presence of strong results and the ability to maintain disciplinary plasticity (Lyytinen and King, 2004). Ultimately, legitimacy of an academic field comes from receptive stakeholders agreeing that the field provides them with relevant research of real value (King and Lyytinen, 2006).

Therefore, IS researchers contend with the elusive balance of rigor and relevance characterised by the trade-off between intellectual quality and practical applicability (identity and legitimacy) of their research outputs (Applegate, 1999; Applegate and King, 1999; King and Lyytinen, 2006; Rosemann

and Vessey, 2008). Galliers and Land (1987) believed that the measure of success of research in IS (which they defined as an applied discipline and not a pure science) relates to whether our knowledge has been improved to the extent that this improved knowledge can be applied in practice. As a result, Galliers and Land (1987, p.901) proposed that “*if the fruits of our research fail to be applicable in the real world, then our endeavors are relegated to the point of being irrelevant*”. This is made more difficult within the IS domain as a lack of central theories does not give new doctoral researchers a starting point from which they can begin to develop a theoretical contribution (King and Lyytinen, 2006), for example, the community is still trying to get to grips with theorising the Information Technology (IT) artefact (Benbasat and Zmud, 2003; Agarwal and Lucas, 2005; Weber, 2006; Markus and Silver, 2008).

Doctoral research that produces ‘strong results’ that make a contribution to theory and practice demands long periods of sustained effort. However, while theory is not the final game in itself it is essential to the *outcome* of the doctoral research project and has a role in the production of strong results (Lyytinen and King, 2004). Therefore, theory is an input to the research process of getting strong results, not an outcome (King and Lyytinen, 2004). In the context of the doctoral research process, progress is incremental ‘pushing forward the frontier of the known, a bit at a time’ (King and Lyytinen, 2004) and to produce strong results (make a theoretical contribution) there is a need to adhere to high standards with respect to knowledge claims made from the literature reviewed and the ways in which those claims are proposed (operationalising a theoretical framework).

2.1 The Doctoral Research Process in IS

The role of the new doctoral researcher is to undertake academic research which requires the researcher to investigate a research question, systematically and methodologically, with a view to generating scientific knowledge (Collis and Hussey, 2009). Central to this generation of new knowledge (the contribution) is the application of theory. Therefore, the doctoral researcher’s research project follows a *process*, with a *purpose* and *logic*, the *outcome* of which is a contribution to the existing body of scientific knowledge. Indeed, Remenyi and Williams (1995) stated that the prerequisite for conducting sound academic research is to understand the research process. While research is an iterative process, it can be conceptualised as consisting of fundamental stages/phases (Stahl et al., 2008; Collis and Hussey, 2009). The first of these stages/phases is that of ‘project definition’ which involves reviewing the literature and defining the research problem/questions (Stahl et al., 2008; Collis and Hussey, 2009).

The role of theory is central if not more central to the ‘project definition’ stage than any other stage throughout the entire research process (Stahl et al., 2008). As humoured by Agnew (1969) at the beginning of the journey around the *island of research* the researcher starts out at the ‘bay of literature’ just off the ‘sea of theory’! Their appearance at the outset of the journey and their proximity to each other reiterates the importance of theory and its place in literature for the new doctoral researcher. As a result, while theory is a central issue in research, it has particular relevance to new researchers, such as doctoral researchers, who are under a ‘strong expectation’ to be ‘conversant with theoretical issues in their field of study’ (Stahl et al., 2008). However, every doctoral researcher is ‘unique in his or her attitude and ability’ and the process of developing into a competent candidate is ‘highly idiosyncratic for every student’ (Grover, 2007). Therefore, new doctoral researchers ‘must embody a minimum threshold of motivation and competence’ in order to successfully engage in the ‘unstructured and often frustrating process of knowledge creation’ and participate at a ‘higher level of learning’ which ultimately leads to the ‘creation of a quality knowledge product’ (Grover, 2007), the starting point of which is the literature review.

If we embrace the arguments of Webster and Watson (2002) we can draw some parallels between a new doctoral researcher and the IS field itself. They argued that the theoretical progress of the IS field has been impeded by the *youth* of the field and the lack of published *review articles*. This assessment

of the IS field in terms of youth and lack of published review articles (by more established senior IS scholars) can translate metaphorically to the youth of a new doctoral researcher who has a lack of practical experience or 'talent' (c.f. DiMaggio, 1995) in, and exposure to, crafting and writing a literature review. It could be that the challenges remain the same in both cases. Indeed, Webster and Watson (2002) and Schwarz et al. (2007) have suggested that 'assembling' a review or framework article in an interdisciplinary field (like IS) is a complex and challenging process where there is a need to draw on theories from various fields. In fact, Schwarz et al. (2007) argue that there is a lack of publication outlets within IS for these types of review and framework articles. Schwarz et al. (2007) further suggest that these articles can serve an important role in developing consensus on research efforts in the IS discipline while helping the field become more paradigmatically developed; however, not only senior scholars, but all colleagues, should be engaged in the production of these types of articles as a priority. Nevertheless, while the literature review represents the foundation of research in IS (c.f. Webster and Watson, 2002), new doctoral researchers have to contend with the status quo, relying mainly on empirical research articles where the literature review is 'much more narrowly focused' (c.f. Schwarz et al., 2007, p.43). Therefore, it is worth noting that the initial focus of attention for our pedagogical artefact is on empirical research articles (journal and conference) as opposed to purely conceptual articles and textbooks.

2.2 The Literature Review

A review of prior, relevant literature is an essential feature of an academic research project; furthermore, if completed effectively, a thorough literature review lays the foundation for advancing knowledge (Webster and Watson, 2002) and it can help researchers avoid 'reinventing the wheel' by enabling them to synthesise and build on what others have done (Zorn and Campbell, 2006). One of the purposes of the literature review is to identify theory/theories to provide a theoretical framework for a research study, especially when embarking on empirical research. This theoretical framework is a fundamental part of the research study and underpins the research questions (Collis and Hussey, 2009). However, for the new doctoral researcher "*one of the most intimidating aspects of a literature review is encountering the messy nature of knowledge, due to the fact that concepts transcend disciplinary boundaries, and literature can be found in a wide range of different kinds of sources*" (Rowley and Slack, 2004, p.32).

Webster and Watson (2002) provided researchers with an approach to reviewing literature and writing a literature review and suggested that researchers should 'go backward' and 'go forward' using citations of the 'major contributions' in 'leading journals'. Initially, according to Webster and Watson (2002) a source of these major contributions will be from one of the several journal databases available, where the 'relevant articles' will be returned by the 'keyword sieve'. However, all too often a doctoral researcher's *naïve* search may focus on the 'wrong sources' (e.g. textbooks and popular press) at the expense of 'scholarly sources' (e.g. academic journals) (Zorn and Campbell, 2006). Therefore, an evaluation of these sources is a 'very real problem'; as Rowley and Slack (2004, p.32) suggest "*both [sources] may have a role in the identification of a research theme, but the academic literature contains a firmer theoretical basis with more critical treatment of concepts and models. Articles in scholarly and research journals should form the core of the literature review*". As a result, how can the doctoral researcher appreciate what a theoretical framework is and how it should be structured if the literature they have reviewed does not communicate the true essence of a theoretical framework and its purpose?

Of course this lack of theory within the body of literature can be due to a number of factors, other than simply focusing on the wrong sources, (e.g. word count restrictions forcing publishing authors to make a judgment call on what to include/exclude as the core value of the manuscript; poor quality publications where, in essence, it may be easier to publish ones research without having to worry about theory; or indeed, a well respected publication with poor reviewing practices). In fact, Sutton and Staw (1995, pp.381-382) highlighted this point by commenting that "*even though journals may*

boldly espouse the goal of theory building, the review process usually works the other way. In practice, it is much easier for a set of reviewers and editors to agree on a carefully crafted empirical piece that has little or no theory than it is for them to go along with a weak test of a new theoretical idea". Given these issues, what alternative does a new doctoral researcher have if the majority of literature deemed critical to the subject area under investigation fails to present any real reference to underlying theory or theoretical foundation for their conceptual or causal argument, other than references and past empirical data? Moreover, with such debate about the role of theory and the absence or otherwise of a theoretical framework in the literature; even greater challenges are posed for the new doctoral researcher as to what it means to make a 'theoretical contribution' especially when undertaking empirical research (Colquitt and Zapata-Phelan, 2007).

It is understood that all research requires a craft or creative leap fueled by the imagination of the researcher (Weick, 1989; Langley, 1999). Indeed, Schmenner et al. (2009, p.341), when commenting on the operations management field, suggest that *"there is a need to teach our doctoral students differently and we need to review one another's papers with less of an eye to methodology and more of an eye to creativity, insight, and understanding"*. It cannot but be argued that there is craft in the development of a bounded thesis from abundant and diverse data that is available in the world (Daft, 1983; Bryman, 1992). Yet, this craft is only but one part of the doctoral research process. However, guidance for new doctoral researchers often points them towards developing such a nebulous craft or capability that comes from experience. As noted by Hart (1998, p.5), this involves developing an *"understanding of the interrelationship between theory, method and research design, practical skills and particular methods, the knowledge base of the subject and methodological foundations"*. However, with very little guidelines, new doctoral researchers are expected to adopt a trial and error approach as they figure out the intricacies of adding to the body of knowledge (the core aspect of doctoral research). In the next section we attempt to support new doctoral researchers in this process and present the conceptual data model design of our pedagogical artefact.

3 Design of the Pedagogical Artefact

According to Stahl et al. (2008, p.32) theory *"is difficult to grasp when made an explicit object of reflection"*. From the perspective of the IS field, Lyytinen (1987) suggested that the academic community does not have any framework for relating IS theories to each other, which makes the selection and combined use of theories difficult. Therefore, the task of a new doctoral researcher within the IS domain is particularly difficult and the continuing high level discussions of what theory is and how it can be used in the IS discipline, which lacks a long history or strong institutional standing (Stahl et al., 2008; Gregor, 2006; Truex et al., 2006), may be futile and appear fruitless to date. We can appreciate that confusion around what theory is and the role it plays in research can be a common defining characteristic of a new doctoral researcher's experiences at the early stages of the doctoral research process, especially when surveying and reviewing the literature. For example, Sutton & Staw (1995, p.371) warned that *"the literature on theory building can leave a reader more rather than less confused about how to write a paper that contains strong theory"*. However, more recently and specifically related to the IS domain, Metcalfe (2004, p.13) argued that *"the word 'theory' has so many interpretations that the research drivers intended to be communicated are being blocked for new researchers"*. Indeed, Metcalfe (2004) suggests that we need an alternative language and it is misguided to call for more improved theory in IS until we are sure what theory is. In support of this call by Metcalfe we hope that we can deliver a comprehensive but parsimonious pedagogical artefact for new doctoral researchers that will enable them to assess the theoretical strength of the literature they survey and review, while also facilitating the development of a concept-centric matrix (c.f. Webster and Watson, 2002) for their chosen research topic.

While there will always be a number of theories, concepts and models to draw on, which can be discovered during the literature review of a chosen topic, we argue that a new doctoral researcher's

maturity of understanding of what is being argued in this literature and the theoretical strength of the argument will be low. Therefore, the fact that the theoretical strength of the literature a new doctoral researcher reviews may be questionable, may leave the new researcher in no greater a position to better understand the role of theory in the research process, or indeed, how to develop a theoretical framework for their own research project. It is worth reiterating that the *outcome* of the doctoral research process translates as the new doctoral researcher's ability to generate new scientific knowledge in their chosen field. Therefore, irrespective of the prevailing paradigm (e.g. positivist/interpretive) and associated perspective on the role and use of theory (Colquitt and Zapata-Phelan, 2007), the task of developing a theoretical framework, through critiquing existing literature, and making a theoretical contribution is still confusing for a new doctoral researcher (Collis and Hussey, 2009) with very little guidance available (Zorn and Campbell, 2006).

It is difficult to overstate the importance of theory to the scientific endeavour (Colquitt and Zapata-Phelan, 2007). Theory allows scientists to understand and predict outcomes of interest, even if only probabilistically (Kerlinger and Lee, 2000; Colquitt and Zapata-Phelan, 2007). Theory also allows scientists to describe and explain a process or sequence of events (Mohr, 1982; DiMaggio, 1995; Colquitt and Zapata-Phelan, 2007). It is argued that theory prevents scholars from being dazzled by the complexity of the empirical world by providing a linguistic tool for organizing it (Hall and Lindzey, 1957; Dubin, 1976; Bacharach, 1989). In fact, theory is important, not as a substitute for data, but as a framework to guide the collection and interpretation of data; and data is important, not as a substitute for theory, but as the substance, with which theoretical ideas can be induced, tested and revised (McGrath, 1979). The theories we hold, whether explicit or implicit, form a language that we use to understand the world and communicate with others (Kuhn, 1996).

However, there is an ongoing debate as to what constitutes *strong* or *weak* theory which raises a number of issues relating to 'what actually is' and 'what is not' theory. According to Sutton and Staw (1995 p.371) in their essay in *Administrative Science Quarterly* "*there is little agreement about what constitutes strong versus weak theory in the social sciences, but there is more consensus that references, data, variables, diagrams, and hypotheses are not theory. Despite this consensus, however, authors routinely use the five elements in lieu of theory*". Unfortunately, Sutton and Staw (1995) do not have 'magic ideas' about how to construct theory nor do they present a set of algorithms of logical steps for building strong theory. However, they provide an explanation of how each of the five elements mentioned can be 'confused' with theory and how to avoid such confusion.

3.1 The Conceptual Data Model of the Pedagogical Artefact

Before presenting the conceptual data model design of our pedagogical artefact, a definition of theory must be detailed. For the purposes of this paper the authors use a base definition of theory supported by the work of Blalock (1969), Dubin (1976), Bacharach (1989), Whetten (1989) and Doty and Glick (1994), in that, theory is defined as '*a series of logical arguments that specifies a set of relationships among concepts, constructs, or variables*'. However, beyond this there has been no general agreement between theory-development authorities (Dubin, 1978; Whetten, 1989; Wacker, 1998) concerning the relative importance of the virtues of 'good' theory. Nonetheless a synthesis of current theory-development literature in both the general management and IS fields has highlighted six common features, these include: (i) factors/constructs/concepts (*the what*), (ii) relationships (*the how*), (iii) graphical representations/models (*the what & the how*), (iv) theoretical underpinning/assumptions (*the why*), (v) scope/boundary/domain (*the who, where & when*), and (vi) falsifiability (the 'theory type' (c.f. Gregor, 2006) dictates the presence and nature of falsifiability). While Figure 1 presents a visualisation of the common features of theory, a more detailed description/discussion can be found in (Sammon et al., 2010).

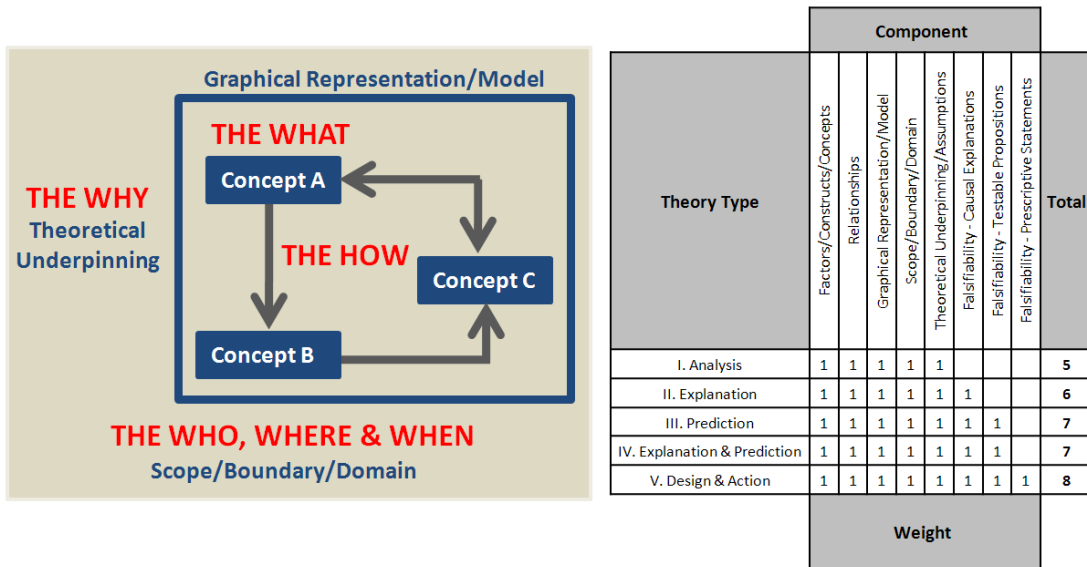


Figure 1. The Common Features of Theory and Theory Type Components

Leveraging the above synthesis, a conceptual data model is derived and presented in Figure 2. For clarity, the entities of the conceptual data model are grouped and coded A-H. As presented in Figure 2, the research article exists at the core of the design as research articles are themselves the main focus of attention during the literature review process. By its design the pedagogical artefact's primary focus is to enable a new doctoral researcher to effectively assess the theoretical strength of the literature they survey and review, while also facilitating the development of a concept-centric matrix.

When a new doctoral researcher reads an article, they should reflect on its contents. As they reflect on the article they should focus their attentions on the concepts being discussed, the relationships between the concepts, a visualisation of the concepts and relationships, the assumptions and perspectives of the author(s), and the scope of the author(s) claims. As a result of this reflexivity the new doctoral researcher is assessing the theoretical strength of the article and records their assessment, therefore, categorising the article (B). Within the pedagogical artefact the theoretical strength of an article is determined by the presence/absence of the components of theory (see Figure 1). Therefore, the new doctoral researcher is determining if these components exist in the article – a yes or no judgement from their perspective. Furthermore, having identified the concepts discussed in the article, the new doctoral researcher also adds these concepts to their concept-centric matrix (A). This matrix evolves as their survey and review of literature continues for their chosen research topic (E).

As the new doctoral researcher progresses through their survey and review of the literature they continue to use the pedagogical artefact to record their theoretical strength assessment of each article they read, while also adding concepts emerging from each article to their concept-centric matrix. Therefore, this continuous categorisation of each piece of literature affords the new doctoral researcher the opportunity to leverage the results to focus on building theoretical strength into their own arguments as they proceed; for example, developing the theoretical framework to guide making a theoretical contribution. As their maturity of understanding increases, so too will their ability to appreciate the role theory will play in their research, leveraging theoretical gaps, to shape the *outcome* of their research process, producing a theoretical contribution (strong results). Therefore, through the use of the pedagogical artefact proposed here, we are conceptualising the literature review process as a two step activity, which a new doctoral researcher will undertake early in their doctoral research project.

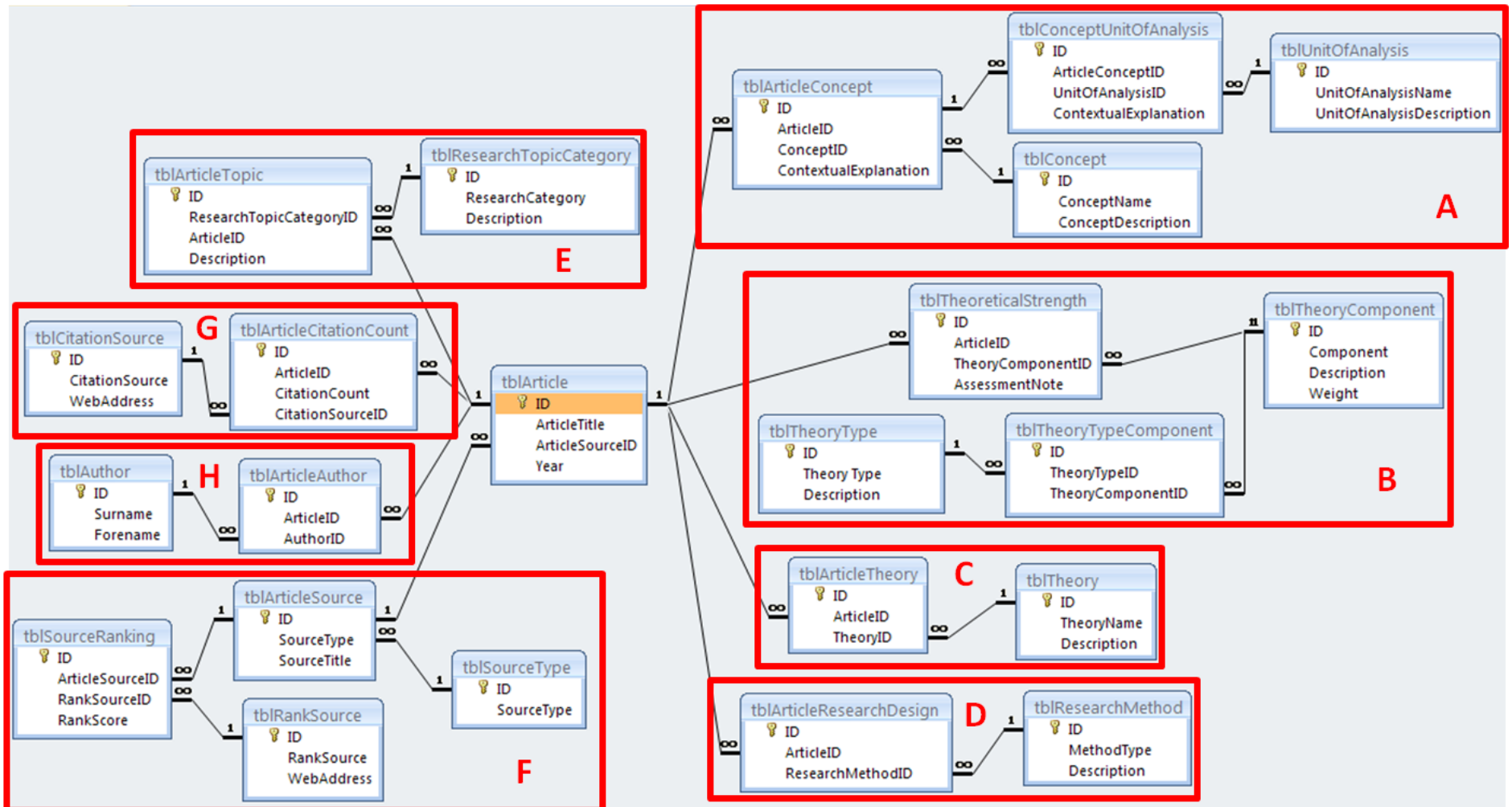


Figure 2. Conceptual Data Model of the Pedagogical Artefact

Furthermore, the conceptual data model design is also focused on capturing the following elements of an article:

1. Literature Sources: the pedagogical artefact facilitates new doctoral researchers being cognisant of the source of the article (*F*) and the number of citations associated with the article being reviewed (*G*), while also appreciating the author(s) associated with the article (*H*).
2. Theory and Research Design: the pedagogical artefact supports a new doctoral researcher in keeping track of the theory/theories operationalised in the article (*C*) and the research design adopted within the article (*D*).

4 Discussion and Conclusion

All research and in particular doctoral research needs to be informed by existing knowledge in a subject area. As we have suggested earlier in this paper the literature review identifies and organises the concepts in relevant literature (Webster and Watson, 2002; Rowley and Slack, 2004) and new doctoral researchers are typically expected to undertake a literature review at an early stage in their research project (Collis and Hussey, 2009). As new doctoral researchers build the required expertise of the phenomenon under investigation they need to seek out highly relevant material from whatever source is available. Utilising the pedagogical artefact they will quickly map the theoretical strength of what they read and ultimately that of the domain. It is not unusual for new researchers to be drawn to highly relevant work with little or no theoretical value. However, a problem arises when doctoral researchers use this highly relevant research as the basis or core of their theoretical contribution. Nevertheless, utilising the pedagogical artefact will aid new doctoral researchers to make more informed decisions on the basis of a theoretical foundation from which the theoretical framework for their chosen area of research can be developed. Moreover, by identifying the theoretical components that are lacking from the highly relevant literature they can highlight potential opportunities from which they can develop a stronger theoretical contribution. Thus, this enables a new doctoral researcher to review *relevant* literature while also keeping an eye on the theoretical rigor needed for a contribution. This should go some way to solving the balancing act that doctoral researchers deal with during the literature review process.

This paper has been crafted from the experiences and sense-making efforts of the authors, while also trying to bring as much rigor as possible into the pedagogical artefact design. We now see our efforts as the starting point for our IS colleagues to build on our conceptual data model design and for new doctoral researchers, in particular, to operationalise our pedagogical artefact on their journey around the *island of research*, specifically during their literature review process. To conclude, we believe that our attempts can move our field forward and at the time of writing the development of our web-based pedagogical artefact has commenced, for release to the IS community before the end of 2011.

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