PROD²UCT: an outcome-oriented dissertation study model for construction engineering students

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Abstract

Purpose – This paper presents and describes an outcome-oriented dissertation study model called "PROD²UCT", designed explicitly for students engaged in construction engineering and related subjects research.

Design/methodology/approach – The model is grounded in theory, underpinned by extant literature and reinforced with professional domain expertise.

Findings – PROD²UCT identifies seven key stages in outcome-oriented dissertation study: pick, recognise, organise, document and draft, undertake, consolidate and tell. These are described along with practical considerations for their effective implementation.

Research limitations/implications – The model's primary influences stem from "best practice", experiential knowledge, pedagogical ideals and academic views/values. Given this, it is acknowledged that "representation" and "inference" are typically governed by "subjectivity" (which naturally differs from person-to-person).

Originality/value – Originality is threefold: PROD²UCT encourages students to consider the "end" before the "beginning"; it serves as a road-map offering guidance at seven key chronological stages; finally, it is specifically designed to be outcome-oriented. The latter requires intended dissertation outcomes to align with evidence, research design decisions and implementation methods.

Keywords Construction, Methodology, Learning, Research, Students, Dissertation

Paper type Viewpoint

Introduction

> Effective working […] involves having a continual focus on the end product and making sure that for each subsidiary task […] you keep this in mind (McMillan and Weyers, 2011).

This paper describes an outcome-oriented dissertation study model hereafter called "PROD²UCT". The model is for higher education students engaged in construction engineering dissertation study, which includes subject areas such as building engineering, civil engineering, construction management, property studies, construction information and communication technology, quantity surveying and facilities management. Disciplinary focus reflects that construction engineering dissertation research can embrace many aspects (pure, applied, quantitative, qualitative, mixed, symbolic, experimental, social, etc.) that often, though not exclusively, sets it aside from other disciplines such as Humanities or Social Sciences[1]. Notwithstanding this focus, several pedagogical and self-managed learning concepts within "PROD²UCT" transcend subject boundaries.

Dissertation study can be challenging for many students. "PROD²UCT" can help alleviate this by guiding dissertation students through seven key, chronological dissertation study stages. Each stage is symbolised by specific action words, *ergo*: pick, recognise; organise; document and draft; undertake; consolidate; and tell. The first letter of these action verbs

form the model's acronymic name. Figure 1 contextualises these stages, whose rationale are explained later.

The underpinning pedagogical notion of "PROD²UCT" emphasises that construction engineering dissertation study should typically be outcome, that is, "product" driven. Acknowledging this, the model stages purposefully align to the product to encourage dissertation "success" while embracing other factors (such as student effort!) that influence success too (Hamilton *et al.*, 2010).

The aim of this paper is to explain these stages – what they mean and why they are significant – and to highlight enablers/impediments concerning each. The following section first clarifies the differences between a dissertation and a thesis because this is something that often causes confusion, which in turn exacerbates the former mentioned "challenging experience". Following this, a review of contemporary dissertation study literature helps to contextualise PROD²UCT and serve as a datum to demonstrate its novelty. Explanation of the model's seven key stages concludes the paper.

Dissertation or thesis?
The Oxford English Dictionary (OED, 2015) defines a dissertation as "A written discourse upon or treatment of a subject, in which it is discussed at length". A thesis meanwhile, is "A dissertation to maintain and prove a thesis" where "thesis" means, "A proposition laid down or stated […]" (OED, 2015). Notwithstanding these divergent meanings, "dissertation" and "thesis" are often used synonymously (Dunleavy, 2003, p. 268; Dixon, 2004), but these distinctions are important (Joyner *et al.*, 2013).

To avoid any confusion this may create, it helps to first identify that the defining characteristic of a doctorate is an *original* contribution to knowledge (QAA, 2011). This is why some academic institutions require this to be evidenced in published work evolving from the PhD[2] process (Finn, 2005 p. 163). Given this, a PhD's contribution to knowledge has ultimately to be proven; or be "validated"; in research parlance (Pedersen *et al.*, 2000;
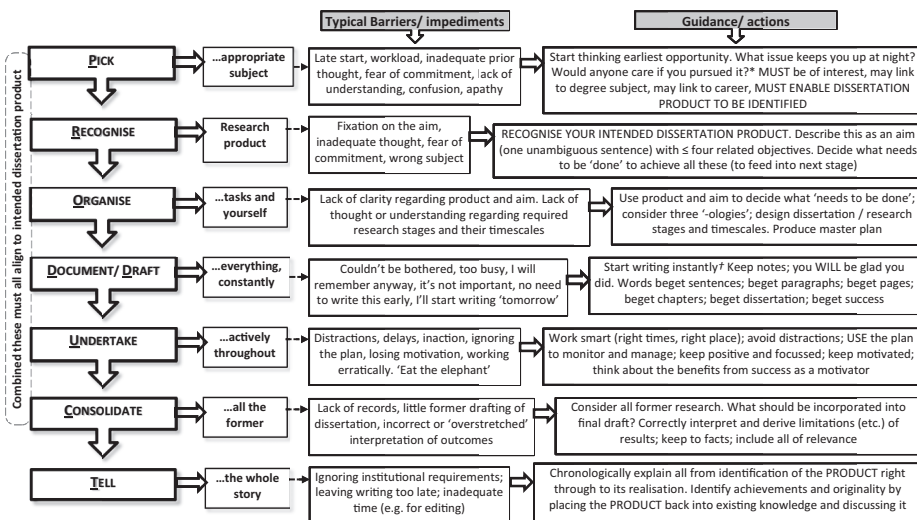

Source: *Questions attributed to (Theoharis, 2010). †See stage four!

Figure 1.
The PROD²UCT
model

Barth *et al.*, 2011). A completed PhD therefore can be presented as a dissertation, but it is also (in a literal sense) a validated "position", proposition or "thesis" (Phillips and Pugh, 2010 p. 48; Newcastle University, 2015).

On the other hand, a (typically undergraduate or masters) dissertation is "[...] an in-depth study of a subject" (Holt, 1998 p. 14), normally linked to the degree topic of study (Naoum, 2007). For instance, a master's degree, by subject specialism such as MSc (Master of Science), MA (Master of Arts), LLM (Master of Laws), LLitt (Master of Letters) and MPhil (Master of Philosophy) (Biggam, 2015). Hence, an undergraduate or master's dissertation (which does not strictly require a defined contribution to knowledge ascribed to that of a PhD) cannot always accurately be called a thesis, whereas a completed PhD can be presented as a dissertation if one remembers that it is reporting a "research thesis" (Petre and Rugg, 2010). Validated originality therefore is the defining thesis criterion (Murray and Beglar, 2013). Table I compares features of undergraduate and masters' dissertations (a PhD can embrace all these aspects in making its original knowledge contribution).

Contemporary literature

There is no shortage of dissertation guidance among the literature, but as Levin (2011) identified, much of this lacks advice on how students should think about what they need to do, and how they should do it (Levin, 2011, p. 14), for example, by concentrating instead on the dissertation process (Cottrell, 2014) or the "concerns and needs" of dissertation students (Hart, 2005). Additionally, Sloan *et al.* (2014) suggested that most of this literature informs undergraduate study and much less so, Masters and PhD dissertations.

Davies' (2007) discourse on research projects is typical of the feed-forward philosophy that frequents the literature, emphasising that the first requirement is a topic, from which a research question should develop. Choosing a topic as the first task in the process is a widespread advice (Winstanley, 2009; Greetham, 2014; Biggam, 2015). Swetnam and Swetnam (2009) suggested this be done in tandem with drafting a (dissertation) title, while Williams (2013) rightly pointed out that the subject should be something the student would like to know more about (therefore helping them maintain an interest in it, see later). The selection of (or more accurately, ultimate arrival at) a topic is "evolutionary" because often this will change as new ideas, perspectives and conceptual relations (etc.) are uncovered (Greetham, 2014). Feed-forward also emphasises incrementalism because one stage influences the next. For instance, basing methodological decisions on the research question (Davies, 2007 pp. 17-18) or using the topic and its literature review to inform research design, and from which data collection and analysis precede the "write-up" (Naoum, 2007). While incrementalism seems logical, it also means that the student does not always know what they are looking to find or "produce" from the research, and hence often, it is only when data are analysed that the "product" *evolves*.

Fellows and Liu (2015) emphasised a more theoretic disposition to construction research based on a theoretical framework, theoretic models, constructs, paradigms and approaches to empiricism; these all being influences on collecting and analysing data to secure an outcome. They allude to early-stage product awareness, in the forms (inter alia) of theory development, model design, hypothesis testing and experimentation. Farrell (2011) suggests outcome-oriented study within construction-specific dissertation literature. This manifests in an early need to identify "Research goals and their measurement", the latter being important metrics if at conclusion to the process (i.e. product realisation), they are to be confirmed. This, based on the sequential logic of dissertation study as presented in Farrell's (2011) treatise, importantly precedes methodology design.

Undergraduate dissertation	Masters dissertation
"... opportunity to undertake independent research on a topic of your choice" (University of Warwick, 2010)	"... is distinguished ... by its attempt to analyse situations in terms of the 'bigger picture'. It seeks answers, explanations, makes comparisons and arrives at generalisations which can be used to extend theory ... it addresses the underlying why" (Herriot Watt University, 2012)
"... opportunity to further develop your subject expertise ... and intellectual independence" (Sheffield Hallam University, 2015)	"... by contrast [to an undergraduate qualification] signifies that the holder has gone beyond the acquisition of general knowledge and has advanced specialised knowledge of a subject" (Biggam, 2015)
"... tests your abilities to educate yourself, to demonstrate your expertise in collecting and analysing information" (Walliman, 2013)	"... communicate conclusions clearly and ... propose new hypotheses" (University of York, 2012)
"... should demonstrate that you have ... attempted to deal with it on your own terms, rather than simply regurgitating the views of others without critical interpretation" (University of Sussex, 2015)	"... a contribution to human knowledge, useful to other scholars and perhaps even to a more general audience" (Penn State University, 2015)
"... selecting a topic, deciding how to go about investigating it, collecting material, analysing data and writing the dissertation are all essential ingredients of DOING ... research" (University of Edinburgh, 2015)	"... require students to engage with their subject area in a more critical manner than they will have done at the undergraduate level ... At this level they will be expected to develop a critical analysis that goes beyond the synthesised reviews typically offered in undergraduate studies. In particular ... develop a clear philosophical and methodological framework for their writing, [enabling] them to craft a much more targeted and incisive analysis" (Ivory Research, 2015)
"... its scale and academic purpose require you to plan and structure your material and ideas carefully, to discuss problems in detail and ... to write a scholarly piece of research" (Kings College London, 2015)	
"... long piece of writing, detailing your independent research, and setting out for other scholars in the field what you have found" (University of Sheffield, 2015)	"... previous work is analysed by the student ... [to] make a case for a certain point of view ... The student then must come up with a hypothesis and do original research to prove or disprove the hypothesis" (Best Counselling Degrees, 2015)
"high level of academic attainment consistent with undergraduate study ... well-structured ... good standard of presentation ... clear aims and objectives ... knowledge and understanding of relevant literature ... well-justified research methodology ... relevant data from appropriate sources ... clear interpretation and presentation of findings ... relevant conclusions" (CIOB, 2015)	"... must demonstrate that the student knows the background and principal works of the research area, and can produce significant scholarly work. It should contain some original contribution whenever possible" (University of British Columbia, 2015)
"test of a number of important skills ... to locate and obtain relevant literature, and to demonstrate skills in literature reviewing ... the ability to structure work, and to organise material in a clear and logical way ..." (Hannigan and Burnard, 2001)	"... distinguished by the relevance of the arguments or creative work to the student's discipline, the quality of the evidence collected or the design or performative principles deployed" (University of Auckland, 2015)
"extended piece of work ... research or inquiry based ... relevant to a discipline" (University of Gloucestershire, 2012)	

Table I.
Defining characteristics of undergraduate and master's dissertations

In contrast to salient features of extant dissertation study literature (Figure 2), the distinctive characteristics of PROD²UCT are summarised as follows. First, it serves as an initial "stimulus" to emphasise key study stages and encourage students to embark on their dissertation journey effectively. Second, it is an *aide-mémoire* of those stages, offering guidance on each along the way. This promotes effective review of the literature, from students knowing what to look for and what questions need answering (regarding their proposed research). Third, the model is outcome-oriented, requiring students
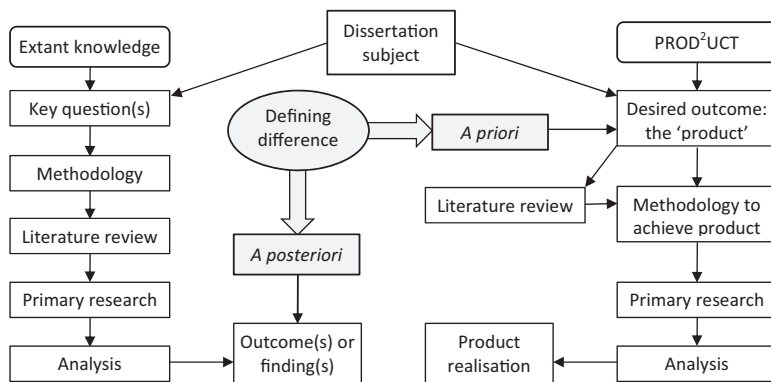
consider what the "product" of their dissertation will be from the outset; and more importantly, use this as the basis of all following aspects of study design and implementation (McMillan and Weyers, 2011). This is particularly so *vis-à-vis* deciding the aim and making methodology decisions, data capture and ways those data can facilitate the desired outcome.

The "outcome-oriented" paradigm makes students focus on what they trying to produce, to ensure that study design maximises the potential to achieve it. Feed-forward paradigms emphasise this less, meaning that students often advance in an incrementally *ad hoc* manner and do not always therefore realise any design failings until the research is established. Often, with negative consequences.

The PROD^{2}UCT model
The following discussion is limited to pertinent PROD^{2}UCT issues, to focus on its distinctiveness and novelty.

Stage one: pick an appropriate subject
Stages one and two are dyadic in that they complement each other and in so doing, should not be considered in isolation. Choosing a subject may seem an "obvious" requirement, but unfortunately, many students leave this decision far too late, often to the detriment of the outcome. This deferment or "reticence" may be for any combination of the following reasons.

First, because of uncertainty, especially, among students who because of apathy and inadequate earlier action, "need to get started" (Fisher, 2010). This is linked to the second issue, timing. Students that have contemplated their subject for some time are much better informed and able to progress more quickly. Third, poor timing and apathy can be exacerbated by fear of commitment (Tuckman, 2010 p. 53), often resulting in "anxiety paralysis" (Smith, 2010), or what Swetnam and Swetnam (2009) described as being overwhelmed (op. cit., p. 2). Committing to a subject is in many ways "final" and has a direct influence on all that follows, including the aim, research product, methodological choices, analysis options, interpretation of outcomes and overall potential for success. The decision therefore is intellectually demanding (O'Hara *et al.*, 2011) and, arguably, the single-most important one in the entire process (Blaxter *et al.*, 2010).

Considerations for the "Pick" stage. Above all else, the chosen subject must inspire and motivate the student, who after all, will eat drink and sleep it for months (Henderson, 2010). A topic of appeal helps a student "play to their strengths" (Greetham, 2009), though choice

will likely reflect the degree subject being studied (Hannigan and Burnard, 2001). While the subject and dissertation title are prone to change (Michael, 2013), its precise (rather than generic) wording can help focus matters (Herriot Watt University, 2012). Choice of subject can also reflect career aspirations (Goddard *et al.*, 1997; Theoharis, 2010) or may, for instance, represent a line of inquiry pertinent to an employer (or future employer), involve student/ employer "collaboration" (Biggam, 2015) or become an assessment criterion (Adams *et al.*, 2007).

Regardless of subject, a dissertation involves original research, so the chosen subject will typically influence methodological opportunities. The product helps decide these by considering things like: does the research require fieldwork, archival work, secondary data, experimental methods, textual or visual analysis, surveys, interviews, participant observation or focus groups? (University of Edinburgh, 2015). In the authors' experience, the association between subject and methodology is not always given adequate thought at undergraduate or masters levels. Often, a student's a priori assumptions are: research *equals* a questionnaire survey; *equals* data; *equals* analysis (of some kind to be determined later); *equals* success! This is not the case, so the first question to answer is what needs to be found out? (Biggam, 2015, p. 42).

That is, the subject should lend itself to a research "need" (often termed 'gap') and, in turn therefore, ultimately yield a research product. If it does not, either the wrong subject has been chosen or matters require further thought. Two further questions useful to contemplate at this point are: what are the issues that keep coming back to you in your thinking? (The "what keeps you up at night"? test); and, what aspects of the subject will be of interest to others? (The "why would anyone else care about this"? test) (Theoharis, 2010). Hence, subject and product are dyadic.

Stage two: recognise the intended product of the study
Stage two requires the product of the research to be determined after subject choice, but *before* anything else, including, deciding the research aim. To explain this, here is a "typical" aim: "To investigate the selection of subcontractors". This (due to lack of focus) tells the reader (supervisor, etc.) little, instead, raising many other questions such as Why? Context? Where? Using what methods? How? These questions arise because there is no hint of what the dissertation is trying to produce and accordingly, therefore, no suggestion of the most appropriate route (especially regarding methodology) to achieve this. Such an ambiguous and expansive aim does not therefore encourage thought on how the research *needs* to be executed, so an *ad hoc*, poorly planned dissertation act will typically ensue. Furthermore, it is implicit that a dissertation will "investigate", "study", "look at", "consider" or "examine" (etc.) the subject, so arguably, there is no need to state this in the aim. The use of operands is therefore particularly important.

Alternatively, consider the following proposed dissertation product:

> The product of my dissertation will be a statistical model, that will use measures of independent variables x to predict the optimal selection of a subcontractor y, under defined procurement conditions.

Identifying the product in this way allows the aim to be subsequently stated in specific (that is, similar) terms, so the student (and others) can now more readily determine the most appropriate research design.

Considerations for the "Recognise" stage. Using the chosen subject as a starting point, the product of the dissertation should be identified before doing anything further. This will be a "calculated aspiration" bearing in mind that research can often yield unexpected outcomes (Willets, 2004). However, a starting point will be to decide whether the product will be a

proposition; a conclusion that challenges traditional wisdom or thinking; a model of a phenomenon (e.g. descriptive/graphical/statistical/algorithmic) or a combination of these. Alternatively, products may be highly specialised, such as to develop organisational procedures, design equipment or produce instructional material (Southampton University, 2015). Recognition of the product therefore informs description of the dissertation aim, which should encapsulate what the research sets out to do in one, unambiguous sentence. Objectives may be decided at this stage, and these should complement (support) the aim, not surpass it. Objectives are "intentions" that can be can be evaluated at the end of the dissertation, to assess whether it was successful or otherwise.

Stage three: organise the work (being mindful of the intended product)

Consider the scenario where a student has picked a subject, described an aim and knows what the outcome of the dissertation exercise will/should or is expected to be. This next stage therefore is about organising what needs to be done, in what order and when, to ensure that the product is achieved. It should culminate in a plan comprising time-constrained stages by which overall progress will be monitored, managed and corrected (where necessary). Of note here, planning is the key to dissertation success (Smith, 2010).

Some change to this plan is expected as the work unfolds because research is unpredictable and often calls for adjustment in the way it is carried out (Borden, 2015). Using the earlier dissertation product as an example (To develop a statistical model using measures of independent variables x to predict optimal selection of subcontractor y [...]), key stages in the plan might include to:

- review extant literature (contextualise the subject, justify the problem, identify potential variables);
- firm up the methodology (decide on appropriate means of resolving the "problem", which in turn informs sample design and the best type(s) of data collection method); in this hypothetical example, data are required of independent variables (x) which may relate to subcontractor characteristics and/or procurement conditions, and independent data such as measures of subcontractor performance or work package outcomes;
- collect appropriate data;
- analyse data (to produce results and build the model);
- interpret results (perhaps test or validate the model for internal/external consistency); and
- conclude and make "recommendations" based on the foregone and accompanying findings combined.

The plan should be of a form that best suits the student and the requirements of the institution, but simplicity and clarity are paramount. Hence, a Gantt chart (Biggam, 2015, pp. 72-73) or work schedule may be appropriate (Naoum, 2007).

Considerations for the "Organise" stage. Achievement of the intended product must inform above all else, what "needs to be done". This, when disaggregated into stages should be represented in a realistic master plan. An "acid test" here is to identify how each stage adds something to product realisation. If any do not, the plan requires more thought. Methodology in the "Organise Stage" is therefore influenced by many factors such as a student's worldview (Holt and Goulding, 2014); knowledge of suitable methods (Fisher, 2010); methodological trends (Aggarwal *et al.*, 2008); whether collaboration is involved (Blaxter *et al.*, 2010); and availability of appropriate resources (such as software) (Siccama and Penna, 2008). Fundamentally, research organisation and design is traditionally influenced by the student as an individual, described in terms of three principal "ologies" (Wellington, 2010). That is:

(1) Ontology, being an individual's view of the nature of reality. For instance, what exists and how can it be reliably measured?

(2) Epistemology, being an individual's view of what represents knowledge and how this relates to the research product. What for instance, is "known" or can be known, about the research problem?

(3) Methodology, which concerns the most appropriate methods to realise the product, based on the student's worldview. For example, is a quantitative or qualitative paradigm optimal?

Stage four: document and draft everything (constantly)

Research has been described as a chaotic endeavour (Brown, 2006). One way to help maintain clarity and create "equilibrium" is to keep detailed research records. Additionally, the dissertation draft should begin early, and advice here is simple: students should start writing their dissertation on day one. Yes, that did read, *"day one"*. As Bolker (1998) advised, dissertation students should write constantly and continuously at every stage, to "tease thought out of chaos".

Considerations for the "Document/Draft" stage. Whether digital or hard copy, research records should be well-organised (GonzÜlez, 2010 p. 44). Every "relevant" interaction or thought should be recorded because what may seem superficial at the time may become vital in the future (Milner and Laughter, 2010). It is also difficult to write accurately about half-forgotten facts, so all "relevancies" should be noted instantly (University of Warwick, 2010). These kinds of chronicle will be visited throughout the dissertation process (Henderson, 2010).

The dissertation draft should start on day one, and thereafter be added-to and constantly revised (Edmonson, 2010) until hand-in date. As Greetham (2009) suggests: "Start writing as soon as ideas come to you, and keep writing". Earliest writing will begin with ideas and their formulation. Even simple "day one" keywords can evolve into ideas and sentences, lists can later form the basis of tables and each graphical *aide-mémoire* (such as mind maps) might ultimately become a figure. These typically help produce the *Introduction* chapter, as does synthesis of the subject, intended product and research aim. Early thoughts from the literature review will eventually become a chapter of the same name, and other (early) critical thinking may feed into the methodological description (for instance). Good dissertation writing results from this early note taking, drafting, adding-to, editing and revising process (Holt, 1998). There is no substitute and there are no shortcuts.

Stage five: undertake the plan (proactively)

Sometimes, the overall task can appear unsurmountable, and at such times, the "how to eat an elephant" philosophy [sic] is useful. That is, take one bite at a time. (Greetham, 2014).

Considerations for the "Undertake" stage. The earlier plan will have disaggregated the dissertation challenge into stages (Tuckman, 2010). So complete ("eat") one stage at a time, and then move on to the next (Calabrese and Smith, 2010). Of course, in doing so, one must not lose sight of the "overall task" and its associated timescale. Thus, constantly review the "master plan" to ensure it is adhered to because major or constant directional changes can cause time "overrun" (Chance, 2010).

The emphasis on being proactive at this stage means to anticipate the next "problem" and work through it. This might call for working at the time, day, place (and so on) that is most productive and recognising that no single solution works for all (Henderson, 2010). Commitment calls for thinking about the dissertation in the same way one would about going to work each day: it is non-negotiable (Chance, 2010). Engagement may also mean

overcoming difficult personal circumstances along the way (Henderson, 2010). Family, work, colleagues, illness and financial concerns can all intervene negatively, and must be juxtaposed with "life/work" balances (GonzÜlez, 2010) and managed (if the master plan is to be achieved). Feelings of inadequacy, lack of confidence and incapability will typically be encountered, but these kinds of emotional and psychological variance is normal (Milner and Laughter, 2010).

Stage six: consolidate (everything)
The consolidation stage was neatly summarised by Fisher (2010): "After a heap of research material has been collected it then remains to make sense of it […]". This stage requires some retrospective thought, whereby all former research needs to be evaluated and considered for its inclusion within the written dissertation (or not) as appropriate. The draft submission date therefore should be evaluated and decisions made regarding what needs adding or deleting, to complete it.

Considerations for the "Consolidate" stage. Making sure everything of relevance is consolidated into the dissertation is therefore important. A dissertation should be the best piece of work a student produces; not least, because it will be electronically archived and become publicly available for the world to view at their leisure (Yiotis, 2008). Indeed, some argue that such repositories are not being fully exploited (Schopfel *et al.*, 2014), so electronic exposure of dissertations may increase in the future.

The aim, objectives and product should all be tangible and explicit. The literature review should show how it adds value to, and informs, the study. The methodology, data collection and analyses must be adequately explained and justified where necessary, by reference to the literature. Meaningful interpretation of all that has happened during the study is therefore essential. This includes the interpretation of results with regard to, for instance, limitations, bias, generalisability, repeatability, etc., and these should not only be accurate but also defendable (Holt, 2014). This means consolidating inputs, outputs, notes, diaries, drafts; in fact, anything that adds tangible value to the dissertation.

Stage seven: tell the whole story (appropriately, in a dissertation!)
Using the results of consolidation helps establish the draft. This is where the student "tells the whole story" of their research, ideally using a chronological logic, because a dissertation macrostructure should broadly mirror what was done and in what order. The emphasis here is to guide the reader through this chronology: from the identification of the product [and expression of delimiters or contextual boundaries], through what was undertaken to realise it, and finally to present and contextualise the product regarding existing knowledge. The more explicit the latter, the clearer will the originality and contribution to knowledge/theory/ practice, etc., made by the student, become. Originality is a defining feature of a good dissertation.

Considerations for the "Tell" stage. For this stage, "appropriate" means that the finished dissertation must comply with the governing guidance that is typically defined in the "module guide", "dissertation handbook" or other control/mandate supplied by the awarding institution. In "telling the story", presentation should align with the institution's assessment criteria, which may include knowledge of the subject, development of research aim and objectives, data analysis and arguments, critical evaluation, presentation, creativity, originality, referencing, independence and initiative (Pathirage *et al.*, 2007).

Advice on dissertation composition, writing and metadiscourse is abundant in extant literature (Cooley and Lewkowicz, 2003; Hyland, 2004). However, construction-specific guidance is available in bespoke literature, including Naoum (2007), Fellows and Liu (2015), Knight and Ruddock (2008) and Farrell (2011). Notwithstanding these sources, institutional

guidance – which can vary among subjects, departments and universities (Levin, 2011) –
must take precedence.

The finished dissertation should be the best piece of academic work a student can achieve,
but this ambition needs to be counterbalanced with other demands. Striving for "absolute
perfection" should be avoided (Smith, 2010), or writing may never be completed. Finally, if as
recommended earlier, the dissertation write-up began on day one, then the risk of "burnout"
by trying to write it in "one hit" can be avoided (Tuckman, 2010).

Conclusion

A surfeit of guidance on dissertation study frequents extant literature. However, much of this
is noncognate, generic or lacks detail. Particularly, at postgraduate level. Moreover, it
overlooks direct advice on how to think about what needs to be done to produce something
tangible from the exercise. PROD^{2}UCT complements existing knowledge (and guidance) but
is unique in that it advocates an outcome-oriented approach. This contrasts existing
guidance that tends to advocate an iterative, chronological and feed-forward way of
(thinking and) working.

The defining characteristic of PROD^{2}UCT is in its name. It requires students to identify
the intended product of their work before anything else and by doing so, to concentrate on
their research decisions (especially the most important ones such as methodological design).
In short, students must remain mindful of how each aspect of their work and their decisions
thereto, will add something tangible to the product.

Notes

1. Neither the foregone list of subdisciplines nor the list of research facets are exhaustive.
2. This paper refers exclusively to the PhD doctorate for convenience, but other types including
   professional, practice-based and by publication variants (QAA, 2011) are also acknowledged.

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Further reading

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