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Considerations for Building a Schema of the Field During Doctoral Study

by Varun Grover, Clemson University

I often see doctoral students struggle to make sense of the field. This is particularly true when they enter the program and are subject to a barrage of papers. From that time until they get to the dissertation stage, they need to engage in a sense-making process that includes not only understanding their field but also contextualizing their own research within it.

In a previous article, "How Am I Doing? A Checklist for Doctoral Students at Various Stages of Their Program," (*Decision Line*, March 2006, www.decisionsciences.org/DecisionLine/Vol37/37_2/37_2phd.pdf) I suggested that students go through four stages, roughly reflecting the four years of typical doctoral study. These can be called: *The Stage of Exploration*, *The Stage of Engagement*, *The Stage of Consolidation*, and *The Stage of Entry*.

The Stage of Exploration epitomizes first-year students. Despite the plethora of voluminous research many students do when searching for the right program, it doesn't really hit them until they begin doctoral study that this is different—really different—from, say, a professional master's program. Many seriously contemplate leaving the program. Here's when they hear their seniors tell them how hard they need to work, the battles of the job market, the pressures of comprehensive examinations, and the importance of working on research outside the classroom. Many of these concepts are new to students and they have to battle this noise, as they deal with seminars and research articles not written for the common man, and statistical techniques that they never knew existed. It's tough—and to succeed, they need to take a deep breath and explore, question, and learn about where they are, what are they doing there, and where they are going.

The Stage of Engagement is further up the value-added axis. This is exploration with a purpose. Students begin to develop a sense of what doctoral study is, of their position in their institution, and (perhaps) of their chosen profession. This is the stage where students engage with faculty, with published work, and with research ideas. They also begin to sense their path of success through the program—the colleagues and faculty they will need to interact with and a sense of research areas and methods they particularly enjoy. Many students still find it a struggle to prioritize—because opportunities increase and time is becoming increasingly scarce—as they straddle the broad field view and the more narrow personal view of research.

The Stage of Consolidation is when ideas crystallize. Students in this stage are more tightly engaged. They are committed. The institution is committed—irreversibly if students pass their comprehensive examinations. The student here should have a very good sense of their field and its structure, and the ability to position research within that structure. The student should be able to traverse up and down between the supra-system (the broad field) and the sub-system (individual research). Dissertation ideas should be developed, as the student's personal view of research dominates that latter part of this stage. The student should also develop their engagement with the broader profession as they begin to package themselves for the job market.

Finally, *The Stage of Entry* is the ultimate thrust before the student formally enters the profession as a peer.

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This could be a particularly challenging stage as the student has one foot in the home institution and another foot trying to move outside it. Broader notions of career, research stream, and tenure enter the student's consciousness, as do family, location, and job satisfaction. The "light at the end of the tunnel" keeps the student going as the process culminates with a doctoral degree.

As the student goes through these stages, there is a maturation of thinking about the field. This is quite challenging as fields (like Information Systems) grow and the backdrop of knowledge correspondingly increases. Typically, students bring their perspective of the field to the comprehensive examinations, which occur around the Stage of Consolidation. These exams could be of an in-class or take-home format, where students respond to challenging questions or review papers. In some cases, the exam includes a research proposal or project and presentation. Regardless of the way these exams are conducted, they always test some aspect of the student's understanding of the field. This entails a level of integration of papers, so that they do not sit in isolated pockets but coalesce together to form streams and programs of research, fostering a cumulative tradition and a holistic view of the field. Let's call this holistic view, a "schema." Every student's schema could be different, depending on the way papers are read, aspects are emphasized, and on the approach and interests brought in by the student.

In my experience, the maturation process of "integrating" literature goes through different levels. Interestingly, I see these levels reflected in literature reviews of papers. Even in top journals, not all literature reviews engage in high level integration.

Level 1 Integration is at the RECALL level. When students enter the program (Stage of Exploration) the papers seem to be onerous to read, and students also need to gauge the depth of understanding needed. While this depth could vary based on the way readings are approached by instructors in seminars, for the most part the integration is at a superficial level. Students read new papers and in some cases they mumble to themselves, "I've seen this concept before." This is what I term, the *recall* level of integration. Concepts start clustering together in the student's mind based on recall. After a critical mass of readings, students can group papers together based on similarity of topic, concepts or methods. Better students can use these clusters to begin to construct their rudimentary schema of the field, which might comprise of groups of "common" articles and (perhaps) articles that fall between the groups. However, typically, readings don't cover the breadth of the field in this stage—so at best it is a partial rudimentary schema. However, the first seeds of integration have been sowed and students get used to the style and nomenclature of the field and its constituent parts. They can also develop an affective reaction to papers, which can lead to development of research interests.

Level 2 Integration is at the complementarity level. This is where students begin to see how papers complement each other. For instance, within a clustering of papers (e.g., a research stream), students can begin to see components of knowledge come together. In any dyad of papers picked from the cluster, they might mutter to themselves, "I can see how paper one enhances the value of paper two." For instance, two papers testing different constructs with similar dependent variables allow the students to consider how disparate models (and perhaps disparate theoretical frames) work together. The integration is far richer than Level 1, as students can build clusters not only on commonality of concepts, but also on how the concepts work together to build knowledge. The knowledge construct is better delineated, and synthesis of the literature beyond a simple chronological narrative is more readily conducted. For instance, if students are summarizing a stream of research, those who have reached this level will be able to readily identify stages through which the knowledge and understanding evolved, and the contribution of each paper to the stream. Or, they will be able to readily represent the stream with a schematic that reflects how the different papers "fit" into a knowledge structure. Of course, it is possible and perhaps likely that students might be at level 2 integration with some stream(s) and at level 1 (or even lower—no real integration) with others. Clearly, students are in a far better position to contextualize their own research if they are at level 2 integration.

Level 3 Integration is at the value level. Here, students can not only see the common concepts and construct knowledge, but also be able to identify limitations and opportunities for new knowledge creation. Students at Level 3 can "see" the knowledge in a stream of work, and benchmark it with a normative ideal or a desirable outcome. In any stream they might mutter to themselves, "This concept is important here; why is it missing from this stream?" In doing so, students identify new research opportunities. The benchmarking can be done in various ways, but it involves not only a good understanding of the stream itself, but often a good understanding (Level 3) of the broader field or even what is important to practice. For instance, students might be able to identify knowledge constructs and the extent to which they have or have not been studied, as well as the import of that revelation for adding value in the future. They might be able to identify how two theoretical perspectives have been used in the field and engage them in a theoretical tension (perhaps, each providing different predictions), thereby fostering opportunities to develop new ideas in the fertile ground between the theories. In some cases, the value is identified by benchmarking the knowledge with gaps in practice. While it is rare to see someone realize Level 3 integration for the field as a whole, some doctoral students do achieve this prior to comps for a stream or two. In good quality doctoral dissertations, students need to engage in Level 3 Integration in order to better motivate and contextualize their study.

I have seen that many doctoral students get a broad sense of the field and get to Level 2 integration for some areas and Level 1 for others. Therefore, their schema has a diversity of integration

structures in place. For comprehensive exams (in the Stage of Consolidation), Level 2 Integration is desirable. Often, students start working on their own projects (in the Stage of Engagement) and start building integrative structures for portions of the field. They then need to consolidate these structures for a more holistic understanding. Others work with the broad structure and then systematically build higher integration for different areas. *Figure 1* maps the levels of integration with the stages of the program, acknowledging that there will be variance in the level achieved across both students and areas.

From a student's perspective, there are ways to benchmark the level of integration. For instance, Level 1 Integration spawns questions like: "Can I identify groups of papers with common concepts, theories or methods?" "How are the concepts used in each paper?" "Can I identify the key areas of research in the field?" "Can I filter new readings into my clusters?"

Students are at Level 2 Integration when they can answer questions like: "Can I see how individual papers and concepts contribute to knowledge in the field?" "Can I see how each paper in a stream complements another paper in the stream?" "Can I create a schematic of knowledge representation for a cluster of papers?" For Level 3 Integration, questions are: "Can I identify gaps and opportunities within a stream?" "Can I engage theories at a higher meta-theoretic level?" "Can I identify how to create new knowledge in the field that would benefit practice?"

As a general prescription, students should try to gain higher levels of integration in their schema. Not only will it serve the short-term goals of getting through institutional requirements like the comprehensive exams, but it will also help produce better quality literature reviews, and better positioning of dissertation and other research. It also helps them get a deeper sense of the field, converse with people, and get a sense of belonging. More importantly, students stabilize their schema during doctoral study. This schema then evolves slowly during post-doctoral years (when there is less time and incentive to read). Therefore, the quality of the schema formed in the doctoral program will create a foundation that affects the research platform and perhaps even research quality and productivity in later years. ■

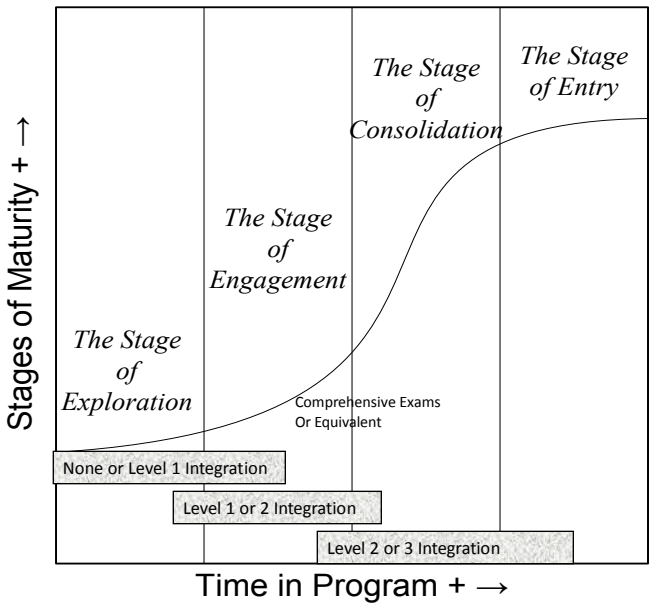

Figure 1. Stages of PhD and Integration of Research.

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