Enhancing the Acquisition of Research Skills in Online Doctoral Programs: The Ewing Model©

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Abstract

Failure to complete a dissertation or other required research project is a major factor contributing to doctoral program attrition. The challenges of planning and carrying out a research project are daunting for many traditional students and may be increased for students in part-time, predominantly online doctoral programs. This paper describes the Ewing Model© developed and implemented in the Doctor of Health Sciences program at A.T. Still University. The Model is characterized by a highly structured, sequential curriculum; intense facilitation and dialogue; collaborative learning within a cohort model; and performance-based assessment of core research competencies. The Ewing Model benefits students and the University by ensuring that students gain important research competencies and by contributing to high program completion and low attrition rates. Challenges of implementing the Model include addressing students' inexperience with research and scholarly writing, adhering to research ethics, assisting students with defining a manageable project, and navigating a three-person internal/external committee. Preliminary results of the Model have been positive, with a current graduation rate of 73% and positive student feedback regarding the structure and design of the Model.

Keywords: doctoral dissertation, research training, distance education, online learning, degree completion rates

Introduction

Low graduation rates are a major challenge facing academic doctoral programs. Between 25% to 80% of students beginning a doctoral course of study do not complete the degree (Baird, 1990; Bowen & Rudenstine, 1992; Council of Graduate Schools [CGS], 2008; Golde, 2000; Kittell-Limerick, 2005; Lovitts, 2001; Wensvoort, 2011; Yeager, 2008). The Council of Graduate Schools collected data on 19,000 doctoral degree students from 1992 to 1998 from 29 universities in the United States and Canada (CGS, 2008). The results of this large study showed that, though there were some variations in completion rates by area of study, on average only 46% and 57% of students completed their doctorate in seven and 10 years, respectively. Completion rates can also be influenced by intensity of study; in a cohort of over 19,000 students entering doctoral study in England, 71% of full-time students earned a Ph.D. after seven years, compared to only 34% of part-time students (Higher Education Funding Council for England, 2005). This trend represents a long-standing issue. As early as the 1960s, doctoral degree attrition rates have been estimated at 50% although recordkeeping and quantitative data supporting this claim are limited (Yeager, 2008).

Low doctoral graduation rates reflect poorly on universities and can impact reputation, accreditation, financial aid programs, external funding, research, grant and publication opportunities, and institutional resource allocation (Kerlin, 1995; Lovitts, 2001). The student can also experience extensive fiscal and personal loss because of lack of degree completion, for example, expenditures for tuition and textbooks, student loan debt, a potential negative impact on career advancement, reduced professional status, and psychological outcomes, such as feeling a sense of failure (Lovitts, 2001; Sternberg, 1981). Finally, society is deprived of doctoral-prepared professionals who could contribute at advanced levels of leadership in healthcare, academic, and research settings (Ad Hoc Panel on Graduate Attrition Advisory Committee, Office of Scientific and Engineering Personnel, National Research Council, 1996).

One of the primary factors contributing to low doctoral completion rates is the students' failure to complete the dissertation (Bowen & Rudenstine, 1992; Sternberg, 1981). In fact, the commonality of this occurrence has led to the phrase "all but dissertation" (ABD). Situational, institutional, and dispositional barriers contribute to the ABD phenomenon (Cross, 1981; Yeager, 2008). Situational barriers include time constraints; many doctoral students have competing responsibilities in their career and personal lives. Financial limitations and scarce opportunities for sponsorship and scholarship are added burdens. Institutional barriers include lack of structured support, lack of mentorship, and poorly qualified faculty guiding students through the dissertation or research project phase of the degree. Lastly, dispositional barriers include lack of student self-discipline to pursue the research phase of the degree in an unstructured environment with limited supervision.

In addition to situational, institutional, and dispositional barriers, the challenging content in research methodology and statistics courses and the students' resulting apprehension can further complicate the doctoral research process (van Eeden-Moorefield & Walsh, 2010). For example, Coleman and Conrad (2007) found that graduate students were less satisfied with courses containing research methodology content compared to courses without such content, even when both courses were taught by the same instructor.

Acquiring research skills and completing required doctoral research projects in an online environment can be especially challenging for students. This difficulty may explain why online doctoral-level research methodology courses remain limited (Lim, Dannels, & Watkins, 2008). Some experts note that online teaching strategies may not facilitate the doctoral research experience because they are not conducive to a community of researchers (Wikeley & Muschamp, 2004). Other researchers have discussed the challenge of maintaining high-quality research preparation in online doctoral programs (Butcher & Sieminski, 2006; Winston & Fields, 2003). As Lim et al. note, "Many scholars have been skeptical about the possibility of developing research skills among doctoral students in a virtual space" due to the absence of a traditional, face-to-face, mentor-mentee relationship (2008, p. 234). Furthermore, recent research has shown that student anxiety from research-related coursework is more pronounced in an online learning environment (DeVaney, 2010). Due to increasing online enrollment (Allen & Seaman, 2010), online doctoral programs will need to effectively foster research skills among students and successfully mentor students through required research projects, from formulation of the research question to dissemination of outcomes.

While online educational programs cannot control challenges, such as dispositional barriers, they can control the structure and delivery of the research curriculum. The general principles of good pedagogy are

key factors to consider when planning the structure and delivery of research coursework. These principles include engaging students in constructivist learning, offering learning activities that foster synthesis and critical analysis, promoting levels of interactivity among learners and instructors, employing consistent feedback, and ensuring meaningful engagement with the material (Brennan, 2003a, 2003b; Dixon & Dixon, 2010). Additional principles for facilitating the research process in online doctoral programs include using high levels of structure, incorporating assessment into the process of research progression, fostering the development of a community of researchers, adopting skilled facilitation, and increasing dialogue to reduce transactional distance (Butcher & Sieminski, 2006; Giddings, Campbell, & Maclaren, 2006; Lim et al., 2008; Wikeley & Muschamp, 2004). The purpose of this paper is to describe the Ewing Model©, an innovative framework that incorporates the above principles to facilitate the completion of doctoral research projects and to enhance the likelihood of doctoral degree completion.

The Ewing Model was designed to aid student learning and to build confidence and skills through the application of research principles in a doctoral program in the health sciences. The Model was structured with a series of five courses that teach the fundamentals of research in a sequential order while students apply the theory concurrently to student-directed research projects. This unique framework has contributed to low attrition rates through its highly facilitated learning environment, finite and stringent timelines for completion of all components of the research process, and integration of research course work with theory application in research projects.

The Doctor of Health Sciences Program at A.T. Still University

Recognizing that advanced degree options are limited for healthcare professionals who manage a host of life and employment responsibilities, A.T. Still University's Arizona School of Health Sciences created a doctoral program that was academically rigorous and professionally accommodating. To this end, the Doctor of Health Sciences (DHSc) is a blended, 95% online degree program for healthcare professionals. A professional doctorate has an "explicitly professional orientation; generally requiring part-time independent study supported by blocks of taught components" (Butcher & Sieminski, 2006, p. 59). Often these degrees are offered as distance education programs. While increasingly popular in nature, advanced professional degrees in the health sciences remain rare. The DHSc program at A.T. Still University seeks to fill this void.

A vital component of A.T. Still University's DHSc program is the completion of an applied research project (ARP), resulting in a manuscript acceptable for submission to a peer-reviewed journal. The ARP is a rigorous project that fulfills 25 credits (36%) of the program's 70-credit curriculum. It requires students to incorporate theory into practice to enhance learning and skill development in applied research. The ARP is intended to positively impact students' professional careers by providing evidence of peer-reviewed work and by enhancing knowledge and critical thinking of research methodology. Successful completion of the ARP, a requirement for graduation from the DHSc program, necessitated the design of a model that would facilitate project completion, thereby keeping program attrition rates low. The Ewing Model was developed specifically for this purpose, and entails both a process and a product. The process of the Model is characterized by four interrelated elements, as described in Figure 1. The product resulting from implementation of the Model is a successfully completed student research project.

Components of the Ewing Model

Highly Structured, Sequential Curriculum

A well-noted factor contributing to the ABD phenomenon in residential doctoral programs is the lack of a highly structured curriculum. Students are often left to navigate their research projects independently and must seek guidance from their advisors on an as-needed basis. As Butcher and Sieminski (2006) note, a "highly systemised structure is often missing from the isolation of traditional full-time or part-time PhD study" (p. 61). The resulting isolation can be a source of significant stress, contributing to feelings of powerlessness and despair (Bowen & Rudenstine, 1992; Sternberg, 1981). Therefore, the doctoral process is often viewed by students as a form of "hazing" in which there are no clear rules, and where completion is based on endurance and the ability to effectively jump through "hoops" (Kerlin, 1995, pp. 3-4).

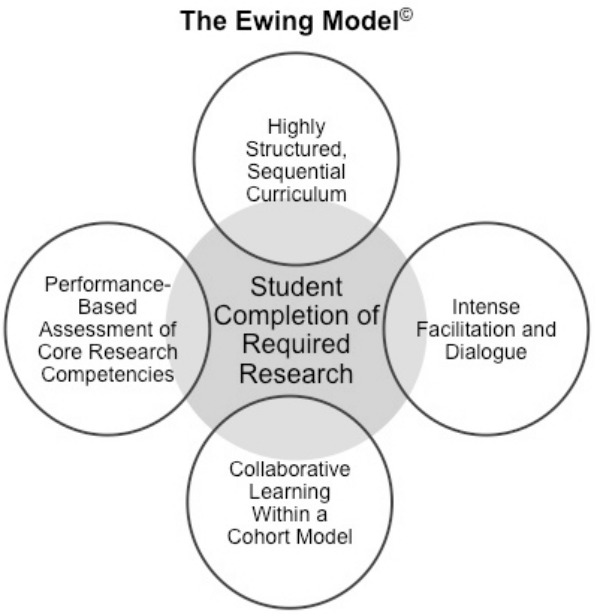

Figure 1. *The Ewing Model for facilitating student research projects*

To address this lack of structure, the Ewing Model uses a highly structured, sequential curriculum that guides students through a stepwise series of research courses as they complete the ARP (Figure 2). The ARP prerequisite course, *Research Methods, Design, and Analysis*, is designed to help students understand and apply the fundamentals of research methodology and to learn to critique the literature. In the first ARP core course, *Literature Review*, students identify an issue or problem relevant to their professional practice or workplace and conduct a thorough review of the applicable literature. The second ARP core course, *Proposal Development*, focuses on the development of a detailed research proposal and submission of a complete institutional review board application. *Data Collection*, the third ARP core course, focuses on data collection while *Data Analysis*, the fourth ARP core course, requires examination and interpretation of study data. Lastly, *Dissemination*, the final ARP core course, involves manuscript preparation and submission to a peer-reviewed journal. The primary goals of the ARP are to assist the student in learning the skills required to critically review research literature, to understand research theory, to apply the principles of research methodology, and to participate in the development and implementation of evidence-based outcomes in their area of practice.

Prerequisite: DHS 802	• ***Research Methods, Design, and Analysis*** • **Core Competencies:** Understand research design; Critically review and critique research
ARP Core: DHS 901	• ***Literature Review*** • **Core Competencies**: Critically analyze and synthesize literature; Write a comprehensive review of literature
ARP Core: DHS 902	• ***Proposal Development*** • **Core Competencies**: Develop detailed, methodologically sound research proposal; Submit insitutional review board application
ARP Core: DHS 903	• ***Data Collection*** • **Core Competencies:** Implement sampling methodology; Collect data; Develop and utilize data collection forms
ARP Core: DHS 904	• ***Data Analysis*** • **Core Competencies**: Complete data analysis to describe sample and test study hypotheses; Write Results section
ARP Core: DHS 905	• ***Dissemination*** • **Core Competencies**: Successfully complete research manuscript; Submit manuscript to peer-reviewed journal

Figure 2. *The Ewing Model's highly structured, sequential curriculum*

Intense Facilitation and Dialogue

Facilitation is an essential principle of effective online teaching and is especially important for student-led research projects (Giddings et al., 2006). Therefore, facilitation is an integral component of the Ewing Model. In fact, faculty who oversee student research projects are given the title of "facilitator" rather than the more common academic titles of "chair," "mentor," or "adviser." Each student is guided by a three-member committee comprised of a facilitator and two committee members. The facilitator, a DHSc program faculty member, takes the lead in assuring consistent, directed, and active contact with the student throughout the ARP curriculum. In this way, the facilitator is intimately involved with the student's research project from topic exploration to manuscript submission.

The second member of the committee is also a DHSc program faculty member whose responsibilities are to assist in each of the student's ARP courses and to provide additional support in topic selection and research design. The third committee member, who is external to the university, is selected by the student and serves as a content expert. The third committee member must have a doctoral or master's degree, or a minimum of 10 years of professional experience in their field.

The facilitation process in the Ewing Model is enhanced by a handbook detailing policies and procedures related to the ARP. Students are encouraged to begin studying the handbook near the end of Research Methods, Design, and Analysis, a prerequisite course that provides a general overview of research methodology prior to the ARP core courses. The handbook describes the purpose of the ARP, student and committee member roles and responsibilities, timelines, and important benchmarks, such as proposal approval and institutional review board submission. The handbook serves as an important resource for students and committee members throughout the ARP process.

In addition to facilitation, Moore (Moore, 1993; 2007) and other leaders in distance education (Garrison, 1993; Gokool-Ramdoo, 2008; Shearer, 2009) note that dialogue is critical in reducing the psychological and communications space, or the transactional distance, in distance learning environments. This reduction in transactional distance leads to increased engagement, improved communications, and fewer misunderstandings between facilitators and students. Many forms of dialogue are used during the facilitation process used in the Ewing Model, including detailed, constructive feedback on all assignments, screencasts, phone conferences, e-mail, synchronous video chat, texting, and face-to-face interaction during a required residential component of the program.

Collaborative Learning within a Cohort Model

A collaborative learning environment is characterized by the sharing of knowledge among students and instructors (Vesisenaho et al., 2010) in a mutual search for "understanding, solutions, or meanings" (Smith & MacGregor, 1992, p. 11). In a collaborative learning environment, students learn through actively exploring or applying course material rather than passively receiving information from the instructor (Brindley, Walti, & Blaschke, 2009).

Collaborative learning is fundamental to the Ewing Model. As students learn research concepts, they actively apply the content to their ARP. The course discussion board within the learning management system is used as a venue for students to process course content and describe how the content applies to their ARP. For example, when students learn about principles of measurement, they are encouraged to post a description of a measurement instrument they plan to use in their ARP, paying special attention to reliability and validity of the instrument. Students attach a copy of the instrument to their post so that other students can review and comment on it. Students are encouraged to provide feedback to one another, post thought-provoking questions, and provide resources contributing to the development of their peers' projects. In addition, the facilitator is actively engaged in the discussion board, providing clarification and encouraging meaningful dialogue.

Other media fostering collaborative learning are also utilized in the Ewing Model. For example, students present an ARP proposal and a final ARP report via synchronous chat sessions attended by DHSc program faculty and students. These chat sessions allow students to present their work via Microsoft PowerPoint and encourage participants to actively ask questions, provide feedback, and share resources. In addition, a virtual poster session is held upon project completion, in which students display a research poster summarizing their ARP. Faculty and students then post asynchronous comments and questions for each poster.

Student cohorts encourage collaborative learning (van Eeden-Moorefield & Walsh, 2010), foster the development of a "community of practice" (Leshem, 2007), and improve student success in distance education programs (Hughes, 2007). Therefore, cohorts are a central component of the Ewing Model. Cohorts are established in the prerequisite course and remain intact throughout the ARP core courses. Thus, students move through the entire research process, from conception to completion, with the same group of peers. To facilitate the collaborative relationships, class sizes are kept small; the average class size is 15 students.

Performance-Based Assessment of Core Research Competencies

To ensure that students move successfully through the research process, the Ewing Model is comprised of a stepwise series of benchmark assignments, which contribute to a completed research project (Table 1). The success of the Model is enhanced by the regular assessment of these performance-based outcomes. Examples of these outcomes include an in-depth research proposal that is approved by the students' committee, an institutional review board submission and approval, the development of a data collection spreadsheet and detailed codebook, and the completion of data analysis and interpretation. Dividing the ARP into small, sequential components makes the process manageable for students because each new assignment builds on the last, culminating in successful completion of the ARP.

Each assignment is graded by the student's facilitator using a detailed grading rubric to assess depth, organization, and presentation. Assignments are graded rigorously, and students are held accountable for demonstrating doctoral-level knowledge and skills. In addition to a completed rubric, facilitators provide in-depth feedback to improve students' projects. Students failing an ARP course must re-take that course and receive a passing grade before moving on to the next course in the series.

Table 1. *Performance-Based Assessment of Core Research Competencies*

Course	Benchmark Assignments	Weight*
DHS 802: *Research Methods, Design, and Analysis* (Prerequisite)	National Institutes of Health Human Subjects Training Course Certificate	5%
	Paper: Putting Research into Practice	20%
	Exercise: Research Article Critique (Quantitative)	30%
	Exercise: Research Article Critique (Qualitative)	30%
DHS 901: *Literature Review* (Core)	Initial ARP Feasibility Analysis	20%
	Final ARP Feasibility Analysis	15%
	Review of Literature - Initial Submission	30%
	Review of Literature - Final Submission	20%
DHS 902: *Proposal Development* (Core)	Initial ARP Proposal Submission	20%
	IRB Informed Consent	15%
	Synchronous ARP Proposal Presentation	20%
	Final Committee-Approved ARP Proposal	15%
	Approved Institutional Review Board (IRB) Application Submission to A.T. Still University IRB	15%
DHS 903: *Data Collection* (Core)	Data Collection Timetable	25%
	Data Entry Spreadsheet	25%
	Submission of Collected Data	35%
DHS 904: *Data Analysis*** (Core)	Description of Research Question, Hypotheses, and Variables	10%
	Description of Sample	25%
	Tentative Analysis Plan	15%
	Results of Hypothesis Testing	30%
DHS 905: *Dissemination* (Core)	Initial Manuscript Submission	15%
	Scientific Poster Submission to Virtual Poster Session	15%
	Synchronous Final ARP Study Presentation	25%
	Submission of Facilitator- and Committee-Approved Manuscript to Peer-Reviewed Journal	30%

* Each course includes 15% credit for discussion board participation.
** DHS 904 also includes weekly review self-tests with a total weight of 5%, but these have been omitted from the table as they are not considered benchmark assignments.

Preliminary Results

Initial results of the Ewing Model have been very positive. Of the 75 students beginning the ARP, 55 students have graduated since the DHSc program began in 2008. Thus, the program has a current completion rate of 73.3% and an average time to completion of 26 months. Further, eight of the 75 (10.7%) students who have followed an alternate academic track have completed the ARP and are on schedule to graduate in the next six months. With the addition of these students, the projected graduation rate is increased to 84%.

Student feedback about the Ewing Model has been very positive, with over 90% of graduates reporting that the sequential structure of completing the ARP was effective. As one student noted:

> *What this program does most brilliantly is taking one step-by-step through the process.*

Another student praised the applicability of the assignments:

> *Learning how to conduct a literature review was a huge learning curve for me! I appreciated the fact that all assignments in this class were geared towards the ARP… there wasn't a lot of extraneous reading or assignment requirements.*

Such student feedback is consistent with Butcher and Sieminski's (2006) assertion that a highly systemized structure is beneficial in the doctoral research process because it improves retention and completion rates (p. 61).

The support fostered by a cohort model coupled with the intense facilitation of the Ewing Model is also highlighted by students as being crucial to their success, as evidenced by the following comments:

> *I really appreciate the layout of the 900 [ARP course] series and how we worked together to complete such a major project*
>
> *The instructor was so accessible and very helpful, timely, and supportive!*

Other comments suggest that students may transfer their learning to professional practice. For example:

> *It has enabled me to learn how to conduct a research study; I've gained valuable information from various academic, research and online sources. I can critically look at and assess areas for improvement and formulate concrete plans to make changes.*

In addition to high completion rates and low attrition within the DHSc program, students have been successful in publishing or presenting their work in a peer-reviewed venue, and many students currently have submissions under review.

Challenges and Lessons Learned

There have been challenges involves in the development and implementation of the Ewing Model. Although many students in the DHSc program have substantial professional experience, most have not been involved in scientific research prior to the ARP. Therefore, the learning curve during the ARP process can be very steep. Further, students who chose a two-year academic degree plan found it incredibly challenging and difficult to manage. Added to their personal and professional obligations, those students were enrolled in three courses per quarter, totaling 11 credits during ARP coursework. As a result, the DHSc Program eliminated the two-year academic degree plan.

A related challenge in implementing the Model is facilitating the development of scholarly writing skills that are necessary to publish in peer-reviewed journals. Many students in the DHSc Program have not had extensive experience with scholarly writing or with following formatting rules, such as the American Psychological Association (APA) guidelines. Therefore, some students struggle with the writing-intensive process of the ARP. A.T. Still University is fortunate to have an online writing center with well-qualified staff to assist students requiring additional help in developing their scholarly writing skills; the DHSc Program frequently utilizes this resource.

Attending to ethical considerations can also be challenging. Students in the program work in many diverse settings, including skilled nursing facilities, hospitals, clinics, prisons, universities, and healthcare corporations. The human subjects involved in students' projects are, therefore, very diverse and, in some cases, are subject to special protections under federal regulations. Furthermore, students reside all over the United States and some internationally, making direct oversight of research projects difficult. Ensuring that the students' research projects are conducted in an ethical manner is a foremost concern for the

program and the university. Consequently, the DHSc Program has worked closely with the A.T. Still University Institutional Review Board to develop policies and procedures that follow the federal regulations governing research on human subjects and the university's IRB policies. These policies are detailed in the ARP Handbook. Developing and submitting an IRB application are built into the ARP coursework, and IRB approval or exemption is a requisite for moving forward with data collection. Thus, facilitators work with students early in the proposal development phase to help them plan projects with minimal risk to subjects that can be reviewed expeditiously or deemed exempt from continuing review by the IRB. While this practice does limit the scope of research that can be conducted, it also reduces the review time and improves the likelihood of timely ARP completion.

Limiting the scope of research projects addresses another challenge of the Model: it prevents students from selecting broad ARP topics that require complex, longitudinal research methodologies. Facilitators work intensively with students to help them narrow down their topic and focus on specific, simple, well-executed designs. Special attention is given to ensure that a student's selected project is feasible and manageable in the time allotted for project completion. Students are encouraged to think of their ARP as pilot research that will give them hands-on experience and that they can build on in future projects after graduation.

Including an external committee member with content expertise strengthens the student projects and fosters collaborative inter-professional relationships between students, faculty, and content experts. The inclusion of external committee members can be challenging, however, if the external member does not provide timely feedback, is unresponsive to the student's questions or requests for guidance, or is reluctant to be included as a coauthor on the final manuscript. To reduce this problem, the DHSc program details, in writing, roles, responsibilities, and expectations of the student and all committee members and articulating the need for timely feedback. External committee members are encouraged to carefully consider their responsibilities and decline the invitation if they feel they will not be able to fulfill them.

Conclusion

A major factor contributing to attrition in doctoral programs is failure to complete a dissertation or other required research project. Conducting a research study is daunting for many students, particularly for part-time students with many professional and personal obligations. Completing a required research project in a predominantly online environment may add complexity to the process (Butcher & Sieminski, 2006; Wikeley & Muschamp, 2004; Winston & Fields, 2003). To address the demands of a required research project with the need for more structure in graduate programs, the Ewing Model provides a highly structured framework for students and emphasizes the demonstration of core competencies. In addition, and in accordance with Moore's (1993, 2007) theory suggesting that a highly structured learning environment with low levels of dialogue leads to increased transactional distance and less student engagement, the Ewing Model also employs a high degree of dialogue between the student and faculty facilitator, as well as between the student and his/her cohort. This Model has strengthened the DHSc Program at A.T. Still University by ensuring that students gain important research competencies and by contributing to high completion and low attrition rates.

The continued, unprecedented growth of online graduate level programs requires evaluation of models aimed at improving completion rates of required student research projects and reducing program attrition. Given the preliminary success of the Ewing Model as described in this paper, future studies evaluating its efficacy are warranted. In addition to continued collection and reporting of data from the A.T. Still University DHSc program, implementation of the Model at different levels of study (master's and baccalaureate), in different institutions, and in other disciplines and settings (such as residential or hybrid) would be valuable.

Acknowledgments

The authors would like to sincerely thank A.T. Still University scientific writer Deborah Goggin for her very helpful suggestions on an earlier draft of this paper. Preliminary versions of the Ewing Model© were presented at the 2011 Association of Schools of Allied Health Professions (ASAHP) Annual Conference (Scottsdale, AZ, October 19-21, 2011) and the 17th Annual Sloan Consortium International Conference on Online Learning (Lake Buena Vista, FL, November 9-11, 2011).

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