Sequentially Structured Online Dissertation Model: Implications for Timely Completion Among Online Psychology Doctoral Students

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Abstract
Research suggests that supportive programmatic structure can assist online doctoral student success, including time to complete the dissertation. However, completely online doctoral students have unique characteristics and needs and are underrepresented in the research literature; therefore, research exploring programmatic factors as related to learning outcomes in this population is warranted. This study investigated differences in time to completion among 3 cohorts of online non-clinical psychology doctoral students: those who experienced a traditional dissertation model, those who experienced a sequentially structured dissertation model, and a transition cohort. We used institutional data from a non-profit, completely online, primarily doctoral-granting university for all doctoral students who completed their psychology PhD from 2013-2020 (n = 430). Analyses indicated time to completion was significantly lower for the sequentially structured cohort compared to the traditional ($p < .001$, $d = .70$) and transition cohorts ($p < .01$, $d = .43$). There was no statistically significant difference between the traditional and transition cohorts ($p = .09$). Overall, these results suggest mechanisms of the sequentially structured model support conscientious student progress with structured proximal goals and mentor feedback loops to guide progress and support timely completion.

Keywords: Online doctoral program, timeliness, doctoral success, psychology doctoral students

As many non-traditional students must balance substantial life responsibilities (e.g., families and careers; Berry & Hughes, 2020), online education offers flexible educational course scheduling that has been found to improve knowledge, skills, and competences (Fresen, 2018; Holton, 2018; Dos Santos, 2020). During the Covid-19 pandemic, most universities in the US shifted to partially or fully online courses. For many dissertation students, this shift involved online mentorship, data collection, and defense, introducing new hardships (Niño & Martinez, 2021). More than 61% of students working on their dissertation during the pandemic reported a negative impact of the pandemic on their progress, with data collection the most likely element impacted (Donohue et al., 2021). Covid-19 may also have impacted students' perceptions of their doctoral journey, specifically increasing concerns about the professional and societal value of obtaining a PhD (Atkinson et al., 2022). Even after the immediate challenges of Covid-19 passed, institutions, professors, and students have had to mitigate pandemic-related interruptions to their educational goals (Daniel, 2020).

Even prior to the pandemic, attrition rates for doctoral programs were of concern. Data from previous research suggested a 40-70% average attrition rate for doctoral programs (Gardner & Gopaul, 2012; Spaulding & Rockinson-Szapkiw, 2012), with an additional 10-20% increase for online students (Allen & Seaman, 2011; Marshall, Greenberg, & Machun, 2012). Despite improvement in time to doctoral completion (e.g., from 1996-2016 decreased from 16 to 12 years for an EdD), the social sciences and humanities average 11.9 years (National Science Foundation [NSF], 2018). One specific "bright spot," comparably, is that students majoring in psychology generally had an 8-year average time to completion compared to 9.6-year average for Humanities (NSF, 2018). It is logical to assume that as program completion takes longer, perhaps beyond a certain threshold of reasonable time-to-completion, students are less likely to complete due to potentially unmanageable debt, overwhelming stress, learned hopelessness, or a variation on these and other issues. In association with high attrition from doctoral programs, timely completion of the dissertation has become a central concern, but the need to complete "on time" often competes with outcome quality (Green & Bowden, 2012).

Timeliness is important in many ways, for students, dissertation committee chairs (also referred to in the literature as faculty supervisors or faculty advisors), programs, and universities (Wao & Onwuegbuzie, 2011) and may be linked to funding for students and universities (Green & Bowden, 2012). Increased time to program completion is linked with increased costs and increased financial responsibility (Hardre & Hackett, 2015) and combined with a lack of financial support challenges students' ability to complete their program (Holly & Caldwell, 2012; Kim & Otts, 2010; West et al., 2011). Students who take longer are less likely to complete, resulting in expenses for both students and institutions (Boone et al., 2020). This investment of financial, intellectual, and temporal resources yields little or no return for the student or university if graduation does not occur, while mean earnings by postsecondary degree level suggest obtaining these post-graduate degrees leads to better labor market outcomes (Lovenheim & Smith, 2022).

Timeliness is also relevant to doctoral student success regarding perceived student progress. For doctoral students, the perception of being behind schedule on dissertation research progress (Barry et al., 2018) or feeling uncertainty about their progress relative to program expectations or requirements (Cornwall et al., 2019) increases stress and anxiety, and may lead

to loss of focus resulting in non-completion of the dissertation (Young et al., 2019). Barry et al. (2018) noted that most doctoral students perceived high levels of stress that contributed to lack of academic productivity, procrastination, and loss of motivation. If lack of progress leads to increased stress, which in turn is linked to procrastination and lack of productivity, supporting timely completion for doctoral students is a key consideration. Further, student perception of progress may be linked with burnout and intention to drop out for doctoral candidates (Prieto et al., 2022). In this way, timeliness may be key to persistence. Depression, anxiety, and stress are significantly higher among doctoral students who self-report being behind schedule when compared with students who report being "on schedule" for their dissertation research (Barry et al., 2018).

Graduate institutions may struggle to assist online doctoral students to make consistent progress on and complete their doctoral research, particularly institutions with open enrollment policies (Burrus et al., 2019). Combined with increased popularity of online doctoral programs (Perrotta & Bohan, 2020) and the switch to online courses due to the pandemic, the importance of identifying best practices and aligning programmatic formatting for timeliness and success of online doctoral students post-pandemic is clear (Rashid & Yadav, 2020). However, student progression toward dissertation completion is not easily influenced by institutions or students striving to improve it. Some authors have argued that universities may not have much ability to influence time to degree as the academic discipline has the strongest influence (Barnes & Randall, 2012). Churchill et al. (2022) investigated predictors of stratified time-to-degree for doctoral students (on-time, on-time plus 18 months maximum, on-time plus 18 months minimum) and found that while gender and age were not predictive, part-time status for both domestic and international students was associated with a higher proportion of students completing on-time. Field of study was also significant, with Health students significantly more likely to be on time (43.3%), followed by Humanities, Arts, and Social Sciences (HASS; 29.9%), then STEM students (11.8%). However, Churchill et al. (2022) also suggested identifying variables associated with time-to-completion which are modifiable as a best practice for universities striving to influence student success.

In this context, identifying best practices within one online university could provide a roadmap for diverse approaches to supporting timely student progress toward completion in online graduate education for other institutions, based on modifiable conditions. For instance, doctoral programs can vary widely by institution in their structure and specific program requirements (Castelló et al., 2017), and research suggests that some aspects of program structure may influence doctoral students' timely completion and success (Bagaka's et al., 2015). Timeliness is important for doctoral student satisfaction, stress, burnout, and attrition (Barry et al., 2018; Prieto et al., 2022; Young et al., 2019). However, timeliness also needs to be embedded in a context where quality is assessed, with some researchers suggesting the importance of rubrics and other methods to reduce evaluation subjectivity (Kumar et al., 2023).

Online doctoral programs are increasingly in demand due to accessibility, practicality, and the recent pandemic. According to the National Center for Education Statistics (NCES, 2022), in Fall 2020, 51.8% of postbaccalaureate (master's and doctoral level) students exclusively took distance education courses. Online learning provides a vehicle for students to engage with instructors regardless of physical distance separating the student from a college or university, while the internet and computers serve as conduits to support the process of learning virtually (Gillett-Swan, 2017; Vancell, 2018). Growing evidence suggests that online education outperforms traditional or grounded education in students' degree completion (e.g., Shea & Bidjerano, 2014). Compared with a more

traditional motivation of attaining a PhD to seek an academic or scholarly research-oriented career, many online doctoral students are seeking knowledge, credibility, or advancement opportunities in a current career (Gardener, 2009; Parker et al., 2020).

Nontraditional students (NTSs) are increasingly represented among online doctoral students (NCES, 2018). NTSs have careers, are older, female, are part-time students with family responsibilities, and ultimately may not be seeking full-time faculty positions (Kumar et al., 2013; Offerman, 2011). Of doctoral students enrolled in completely online degrees in 2015-2016, 42% were over the age of 30, 37% were part-time students, 34% were employed, and 44% were married with dependents (NCES, 2018). NTSs, specifically, have benefitted from flexible educational course scheduling at online institutions that have been found to improve their knowledge, skills, and competencies (Fresen, 2018; Holton, 2018; Dos Santos, 2020). The opportunity of online education that appears to meet a need among NTSs may account for a 42% increase in representation of NTS students which increased from 38% to 84.2% from 2009 to 2017 (Cheng & Yi, 2018; NCES, 2018). Indeed, in addition to fully online universities, traditional (grounded) higher education institutions have implemented online learning opportunities to attract NTSs, which led to 40 million NTSs being enrolled in online classes in 2016 (Dos Santos, 2020; Marine, 2020; Paulsen & McCormick, 2020).

NTSs often carry substantial life responsibilities, such as families and careers (Berry & Hughes, 2020). NTSs engaged in online education must balance competing demands such as coursework, household tasks, parenting, and other familial responsibilities (Blau & Drennan, 2017; Kara et al., 2019). Sapir (2021) also reported that NTSs often carry the financial burden for their education. The NTS label also applies to immigrants, first-generation students, and students with low income (Chen, 2020). For these nontraditional online doctoral students, finding a balance between work demands, family responsibilities, and social life (including socialization opportunities with faculty) to fulfill the requirements of being an online doctoral student is challenging (Akojie et al., 2019; Lim et al., 2019). Conflicting demands can negatively impact online doctoral completion (Bergman et al., 2014; Brown, 2017), time to completion, and can have negative physical and emotional effects including burnout (Rockinson-Szapkiw, et al., 2017). Doctoral completion is challenging in and of itself but may be more difficult for online students who have no access to a physical campus and associated support services (Lim et al., 2019). Students who enroll in online doctoral programs may not understand the requirements and expectations of doctoral programs (Lee, 2020; Roumell & Bolliger, 2017) and have reported that their preparation for doctoral-level work (particularly scholarly writing) was insufficient (Parker et al., 2020).

Despite these challenges, online doctoral programs allow access to higher education for adults with full-time employment pursuing advancement in their current employment or who are not able to attend a traditional graduate program due to geographic or familial responsibilities without accepting negative impacts on current professional and personal roles (Kung, 2017; Lee, 2020). Online doctoral students seek a flexible and "family conducive" environment for pursuing their doctoral degree (Thacker, 2021). Women enrolled in online doctoral programs identified flexibility and access in addition to cost as the primary factors influencing their choice of program and university (Scarpena, 2016). Evidence suggests online doctoral degrees may be particularly more accessible for underserved students (such as first-generation doctoral students; Williams et al., 2019).

Online students must rely on technological systems for communication and academic management (email, video, and virtual learning environment or platform) (Orellana et al., 2016), and persistence in online doctoral programs has been linked to both program design and student knowledge and use of the online environment (Levich & Shaw, 2014). It is important to examine methods that enable online students to succeed in doctoral programs, especially as they enter the challenging dissertation phase and lack tangible resources (i.e., lab space, access to participants) (Marston & Gopaul, 2020). To accommodate the unique needs of online doctoral students, researchers emphasize the need for structure and guidelines to set expectations and reduce challenges associated with asynchronous communication (Kumar & Johnson, 2019). To address a lack of research experience among online doctoral students with no opportunity to observe mentors' research practices, scaffolding is key to developing student research skills (Kumar & Johnson, 2019).

Doctoral supervision or mentorship needs for online students are unique due to limited social contact (Deshpande, 2017; Wilson & James, 2022) and may require more strategic attention (Roumell & Bollinger, 2017). The mentor-mentee partnership may be particularly important for the success of online doctoral students (Brill et al., 2014), as faculty play a central role in guiding doctoral students during the tenuous dissertation phase and the mentoring relationship becomes a "link to an otherwise absent yet critical experience of academia" (Pollard & Kumar, 2021, p. 267). A qualitative study of doctoral graduates experiencing online education during the pandemic suggested that doctoral students were dependent on faculty/chair guidance for their decision-making regarding doctoral persistence (Hurt et al., 2022). Through their association and relationships with faculty, students will likely receive resources and support that enable degree completion (Boone et al., 2020; Newberry & DeLuca, 2013).

Online students credit support and encouragement from their dissertation chair in overcoming self-doubt and persisting in their doctoral program, particularly through "regular check-ins" and encouragement (Torres et al., 2021). Inadequate dissertation committee support can negatively impact both motivation and progress towards completion (Locke & Boyle, 2016), but access to and regular interaction with faculty, a sense of care, and perceived trust contribute to student success (Bagaka's et al., 2015; Hoffman, 2014; Rockinson-Szapkiw et al., 2016). Faculty members play a role in online doctoral student persistence and motivate students by clarifying program requirements, providing university resources and individualized coaching, and building relationships with students (Boone et al., 2020). Online doctoral students report that specific mentor/faculty strategies were key to their dissertation progress and completion, including appropriate technology use, frequent and timely communication, timeliness of feedback, constructive guidance, and moral support.

A recent literature review suggested that individual student characteristics are less reliable predictors of online doctoral persistence compared with institutional factors (Lehan et al., 2021). Online doctoral students identify institutional and departmental supports as critical for persistence (Motte, 2020; Spaulding & Rockinson-Szapkiw, 2016). Levitch and Shaw (2014) concluded that department/program leadership system impacted retention for online doctoral students. Support services such as academic advising, career services, and library resources seem important to online doctoral student success (Fiore et al., 2019; Rockinson-Szapkiw et al., 2016), as do the quality of academic supports and assistance (Ivankova & Stick, 2007). Online doctoral students suggested that information literacy support, institutional resources and workshops, and early scaffolding of research interests in the doctoral coursework were key aspects of program design that supported dissertation completion (Kumar & Coe, 2017). However, some types of institutional support may not impact online doctoral student retention. One study of online doctoral students

found that students receiving virtual research consultations had significantly higher GPA in dissertation courses compared to matched samples but were not more likely to complete their program (Mohr et al., 2022). Other online doctoral students reported mixed experiences with various university support services: positive and timely experiences with some services (writing support) but not others (methodology support, IRB support; Torres et al., 2021).

Balancing dissertation quality and rigor while supporting doctoral students' sense of progress, belongingness and satisfaction with their program is important yet challenging. Individual characteristics do not consistently predict doctoral time to completion, retention, or satisfaction, and systemic factors are only slightly more dependable (Churchill et al., 2022); however, there is evidence to suggest that supportive program structure promotes success of NTSs in online doctoral programs (Kebritchi et al., 2023). The following sequentially structured online dissertation model was built intuitively and innovatively by faculty and administrators to incorporate accountability, quality engagement, and sequential scaffolding of academic skills and student dissertation progress. The success of the model over its tenure could implicate modifiable factors that could be targeted for greater emphasis or de-emphasis in the development of best practices. Preliminary evidence from a blinded review by university faculty and outside faculty found no difference in dissertation quality using the Purdue dissertation checklist between dissertations resulting from this university and Dissertation Benchmark Alliance Schools (Author et al., 2020). Initial research supports quality of doctoral learning using this online model which includes deliberate structure and rubrics (Hussey et al., 2021)

Sequentially Structured Online Dissertation Model

Self-regulation (i.e., goal-setting, reflection, strategizing, modification) by online doctoral students is essential to their success (Ellis, 2019; Li et al., 2018; Shea & Bidjerano, 2018; Stephen et al., 2020), but institutional factors can provide a co-regulating influence on students to keep them focused and progressing (Bohl et al., 2017; Dolch & Zawacki-Richter, 2018; Farr-Wharton et al., 2018; Ngigi & Obura, 2019; Ruot, 2013; Shea & Bidjerano, 2018). This sequentially structured online dissertation model implements mentor feedback and deadlines explicitly within the courses and deliverables approval process; previous research supports interventions to implement intermediate deadlines during the doctoral research sequence increased timely completion rates for European doctoral students (Geven et al., 2018). Further, self-regulation is a concept related to autonomy as proposed in Moore's theory of transactional distance (1993; Giannakoudakis & Giossos, 2018) to be interrelated with course structure and instructor dialogue. Essentially, a sequentially structured online dissertation model encourages self-determination by promoting or co-regulating a mindset of conscientiousness and intentionality that is not emphasized in other institutions. Research implies that a completion mindset where students identify and re-think subsequent steps at each stage with timely completion in mind is necessary for doctoral success (Green & Brown, 2022). Students must constantly keep track of their progress—how far they've come and how far they need to go. Students may be more likely to remain focused on their doctoral goal pursuit because they know there are time limits, and motivation (and corresponding goal setting) has been linked to doctoral persistence (Spaulding & Rockinson-Szapkiw, 2012). By remaining conscientious throughout a structured dissertation experience, students emphasize to themselves that the dissertation is a prominent, valuable goal pursuit.

This model also incorporates regular, timely communication with and feedback from the dissertation chair. Research suggests that aspects of frequent and timely communication, timely feedback (Kumar & Coe, 2017), regular "check-ins" (Torres et al., 2021), and faculty accessibility and responsiveness (Kauffman, 2015) are linked with positive academic outcomes for online doctoral students. This type of dialogue contributes to co-understanding (Giossos et al., 2009) associated with Moore's (1997) theory where the opposite of co-understanding would be increased transactional

distance reflecting a communication gap or "lack of common or mutual perception of knowledge, thoughts, approaches, needs (psychological and educational) and emotions" (p. 3). Postgraduate students' perception of transactional distance in a blended online setting was associated with negative impacts on the learning process (Kassandrinou et al., 2014), and for postgraduate students in an online program, transactional distance was linked with decreased satisfaction (Gavrilis et al., 2020). However, other research suggests that among distance postdoctoral students, no relationship between autonomy and transactional distance was found (Vasiloudis et al., 2015), which may suggest the presence of a moderator (i.e., learning styles or other individual-level student factors).

Until 2016, this US public nonprofit online doctoral research university utilized a traditional dissertation sequence format based on milestone document completion where students were allowed to continue enrollment in dissertation courses without time limits. In 2016, a sequentially structured online dissertation model was implemented based on successful completion of course-based deliverables, evaluated against a faculty-created rubric by 3-member dissertation committees. Many parties were involved in the development of this new online sequence with an intentional focus on research progression, quality of research, and engaging regular interaction with a committee chair. Candidates make weekly submissions of specified dissertation components to scaffold learning and constructively build dissertation components. Each chapter of the dissertation must meet minimum standards on an associated rubric, as scored by the dissertation committee chair and subject matter expert (SME) for every criterion before a doctoral candidate progresses to the next course sequence block. At the proposal and manuscript stages, a third committee member, the academic reader, evaluates the deliverables based on rubric criterion. The course sequence includes a Prospectus and 4 sequential dissertation course blocks (with up to 12 additional supplemental courses). This process was designed to support online doctoral student progress toward dissertation completion promoting strategic goal setting, sustained commitment, and motivated performance despite challenges and obstacles that may arise.

Theoretical Underpinnings to the Sequentially Structured Online Dissertation Model

Most universities utilize common stages (i.e., 5 chapters) of the dissertation, but traditional models typically place less emphasis on timely progression toward completion and structure. Once students complete their coursework and enter doctoral candidacy, the structure and guidelines supporting their progress often disappear (Burns & Gillespie, 2018). Researchers suggest that increased structure in the doctoral phase could increase student success (Gittings et al., 2018). As proposed by Moore (1997), research suggests that programmatic structure may be particularly important for online students, as high structure/high dialogue format reduces the professor/student communication gap for online graduate and undergraduate students (Huang et al., 2016). Decreased transactional distance was associated with higher course structure and course interaction among online graduate students (Alotibi & Miller, 2019).

The temporally framed goal progressions of the sequentially structured online model provide a type of "aft wind" nudging the students forward in a time-bound process, which allows them to better evaluate their progress in measurements of time (see Husman & Lens, 1999). Recently, research on doctoral student success has identified self-perception of progress as a key motivational factor (Prieto et al., 2022). Among Australian doctoral students, positive perception of progress has been linked with lower reported stress, anxiety, and depression (Barry et al., 2018). Among UK postgraduate students, positive self-evaluation of academic progress and

preparation was linked with higher well-being, while negative self-evaluation of progress was associated with increased likelihood of depression and poor sleep (Milicev et al., 2021). Prieto et al. (2022) suggest that such findings support the existence of a "progress cycle," where perceived progress may support positive emotional and mental health outcomes which reinforce productive behaviors, in turn leading to more progress. Further, perceived competence and perceived support from dissertation faculty may foster motivational processes that impact completion and dropout intentions among doctoral students (Litalien & Guay, 2015; Posselt, 2018).

The sequentially structured online model is enhanced for students and institutions alike by implementing accountability measures such as attendance checks, which may serve to promote relatedness to the chair and the institution (see Ryan & Deci, 2017). Relatedness is a sense of "connectedness" or "being known and understood," identified by Ryan and Deci as a key psychological component of motivation and aligns with Moore's conceptualization of reduced transactional distance (1997) or co-understanding (Giossos et al., 2009). Social connectedness or integration with faculty has been linked to doctoral completion (Rockinson-Szapkiw et al., 2016), and doctoral students in a cohort program who did not complete identified lack of relatedness during the transition from coursework to dissertation research as a major reason for attrition (Burns & Gillespie, 2018).

The sequentially structured online model also encourages engagement and quality dialogue (Moore, 1997) between chair and doctoral student, presenting the groundwork for a mentor-mentee dynamic, wherein the chair may serve as what Ericsson (2018) might refer to as an expert mentor or what Vygotsky (1979) would refer to as a knowledgeable other. Vygotsky's (1978) sociocultural theory posits scaffolding as structures and supports to facilitate learning offered by a more knowledgeable other, which has been shown to facilitate doctoral student success (Liechty et al., 2009). This mentor plays an active role in the zone of proximal development—the continuum of individual capability ranging from current mastery to potential mastery with guidance—and scaffolding by facilitating learning (Margolis, 2020) and is integral to the student's success in academic and often emotionally supportive ways (Liechty et al., 2009). Liechty et al. (2009) further suggest that programs and structures must support sequential mastery for appropriate scaffolding to occur. In the sequentially structured model, scaffolding of learning is supported through the sequential building of dissertation components within the course structure with regular dissertation faculty interactions and review of student work. In a meta-synthesis of 118 studies on doctoral attrition, Bair and Haworth (2004) found degree completion was directly related to the amount and quality of contact between doctoral students and their chairs. The literature suggests that promoting doctoral student's communication with their dissertation committee is key to program success (Ames et al., 2018), and university administration should evaluate how they can best provide structured and consistent mentorship (Grady et al., 2014).

Finally, the sequentially structured online model promotes student and institutional progress, awareness, and reflection processes due to the consistent sequential course endings and beginnings, such that students, chairs, and other institutional players remain more cognizant of students' progression over time. Research suggests that doctoral students at high risk for intent to quit may not be identifiable based on socio-demographic or enrollment characteristics (Larcombe et al., 2021), and regular check-ins may be necessary to identify such students. Identifying a student as at-risk sooner is likely to renew their engagement more promptly in goal striving, a key determinant of performance (Ericsson et al., 1993; Locke & Bryan, 1969; Locke

& Latham, 2002; Wood & Locke, 1990), whereas an at-risk student who goes unnoticed may continue to pay substantial tuition without much academic progress. Such students may be more likely to have negative perceptions of their experiences with institutions, which could decrease goal commitment and lead to attrition (Willis & Carmichael, 2011). Goal commitment of doctoral students must be understood and supported by institutions and dissertation chairs if students are to remain motivated to perform until they complete the doctorate; without commitment to goals, students' goals do not imply enhanced motivation or performance (see Locke & Latham, 1990, 1991). Indeed, doctoral student plan commitment and goal commitment, along with supervisor and peer support, are positively associated with study progress (Martinsuo & Turkulainen, 2011) while de-prioritization is associated with non-completion (Burns & Gillespie, 2018).

Students are consistently encouraged to be reflective (Fishbein & Ajzen, 1975) of their doctoral progress and intentional about changes they may need to implement to achieve improved goal task performance. Self-reflexivity toward feedback during dissertation writing must be ongoing, nurtured, and sustained (Muhalim, 2019). Such reflective processes are emphasized by motivational and psychological principles of intentional behavior as illustrated in (a) deliberate practice, which has been tied to academic performance and expertise (Ericsson (1993), (b) conscientiousness, which has been linked to academic performance (Poropat, 2009) including online doctoral student grade point average (GPA; Walsh, 2020) and (c) mindfulness, associated with improved emotional regulation (Hill & Updegraff, 2012; MacDonald et al., 2020) and self-regulation (Ludwig et al., 2020). The sequentially structured model motivates the student to be cognizant of the "ticking clock" of their courses without adding overbearing pressure to finish in an overly tight, restrictive schedule. Previous research suggests that personal motivation contributes to doctoral student success (Lake et al., 2018). Self-motivation has been shown to be predictive of persistence, particularly for online doctoral students (Ivankova & Stick, 2007); students credit their internal motivation as a key factor in persisting during the transition from coursework to doctoral research (Fiore et al., 2019). Self-determination, perseverance, and resourcefulness in the face of obstacles were identified by doctoral students as contributing to persistence and academic resilience (Chamadia & Qureshi, 2021).

Present Study
Although psychology doctoral students are represented in the research literature (El-Ghoroury et al., 2012; Kaufman, 2006; McKinzie et al., 2006), they were largely enrolled in fully or partially on ground programs (Henriksen et al., 2014; Wilcox et al., 2021), clinical or counseling psychology programs (Rico & Bunge, 2021; Tigranyan et al., 2021), professional psychology (Borgogna et al., 2021; Graham & King, 2011) or included in samples of all fields of study represented by a university (e.g., Chinta et al., 2019; Churchill et al., 2022; Kelley & Salisbury-Glennon, 2016;) or in samples of social sciences doctoral students (Bagaka's et al., 2015; Castello et al., 2017). Little is known about how programmatic structure impacts dissertation progress for non-clinical online psychology doctoral students in the US. This study is a valuable addition to existing literature as researchers have identified that online doctoral students warrant scholarly attention, as they have unique characteristics and needs (Akojie et al., 2019). Particularly, there is a need for research studying completely online students (rather than those taking one course online or hybrid programs) (McGaha et al., 2020) and research exploring learning outcomes such as time to completion for online doctoral students (Lehan et al., 2021). Prieto

et al. (2022) further recommended research on the role of progress in doctoral education and outcomes. This study, which examines how a sequentially structured online dissertation model impacts time to completion for online psychology doctoral students in the US contributes to this gap in the literature. In line with a growing body of research, we expected that students experiencing a sequentially structured online dissertation model would complete their doctoral program in significantly less time than students experiencing a traditional non-structured model. Further, we predicted that students in the sequentially structured online model would complete their doctoral program in less time than students in the transitional cohort, who only experienced the sequentially structured online model for part of their dissertation work.

Methods

A quantitative ex-post-facto research design utilized quantitative data to determine how psychology doctoral students' time to completion differed based on dissertation sequence cohort. Ex-post facto, meaning after the fact, is the most relevant approach to the research questions of this study because data had been collected initially for internal data analyses and program analysis. Research was conducted at a completely online public non-profit university located in the western US granting doctoral degrees to a very diverse and underserved student body. Students at this open-enrollment university are largely female, African American, employed full time, and averaging 47 years old per university self-reported data. The university serves largely graduate and post-graduate students, with psychology doctoral students as the sample for the current study.

After acquiring IRB approval, we obtained secondary data from the university office of institutional research for all graduating students from the psychology doctoral program between the years of 2013-2020. Data included time to completion and demographics for all students who completed the psychology doctoral program from 2013 through the end of 2020. This data included all students who successfully completed their degree during those years. However, data on completion time and student demographics could not be linked. Data were provided in separate de-identified data sources, and no consistent identifier linked data in the 2 sources. This meant that demographic data for each de-identified participant were not linked with corresponding time to completion outcomes and so could not be considered as covariates in analysis. The current sample was grouped into 3 cohorts of students (n=430) with 3 distinct online doctoral sequence processes at the university. The 2013-2016 graduating cohort reflected students who experienced the previous dissertation sequence (n=182), a non-structured traditional model. Students graduating between 2017- 2018 reflected a cohort which experienced the transition from the previous sequence to the current sequential sequence (n=124). Students graduating between 2019-2020 experienced only the current dissertation sequence (n=131), the sequentially structured online dissertation model.

Most participants in this study were white (n=246, 57.2%) and female (n = 266, 61.9%), which was consistent with the National Science Foundation Report (2019) demonstrating that women and those who identified as white were the primary recipients of social science and educational doctorates in the US. Participants were also 10% (n=41) Black or African American, 4.7% (n=20) Hispanic or Latinx, 2.3% (n=10) Asian, 0.1% (n=3) American Indian or Alaska Native, 2.6% reported 2 or more ethnicities (n=11) and 22.8% (n=98) participants did not self-

report their ethnicity. The majority reported their age range as 31-81 years (M=55; SD=10.02). There were 11 veterans (2.6%) in this sample.

Table 1

Sociodemographic Characteristics of the Participants

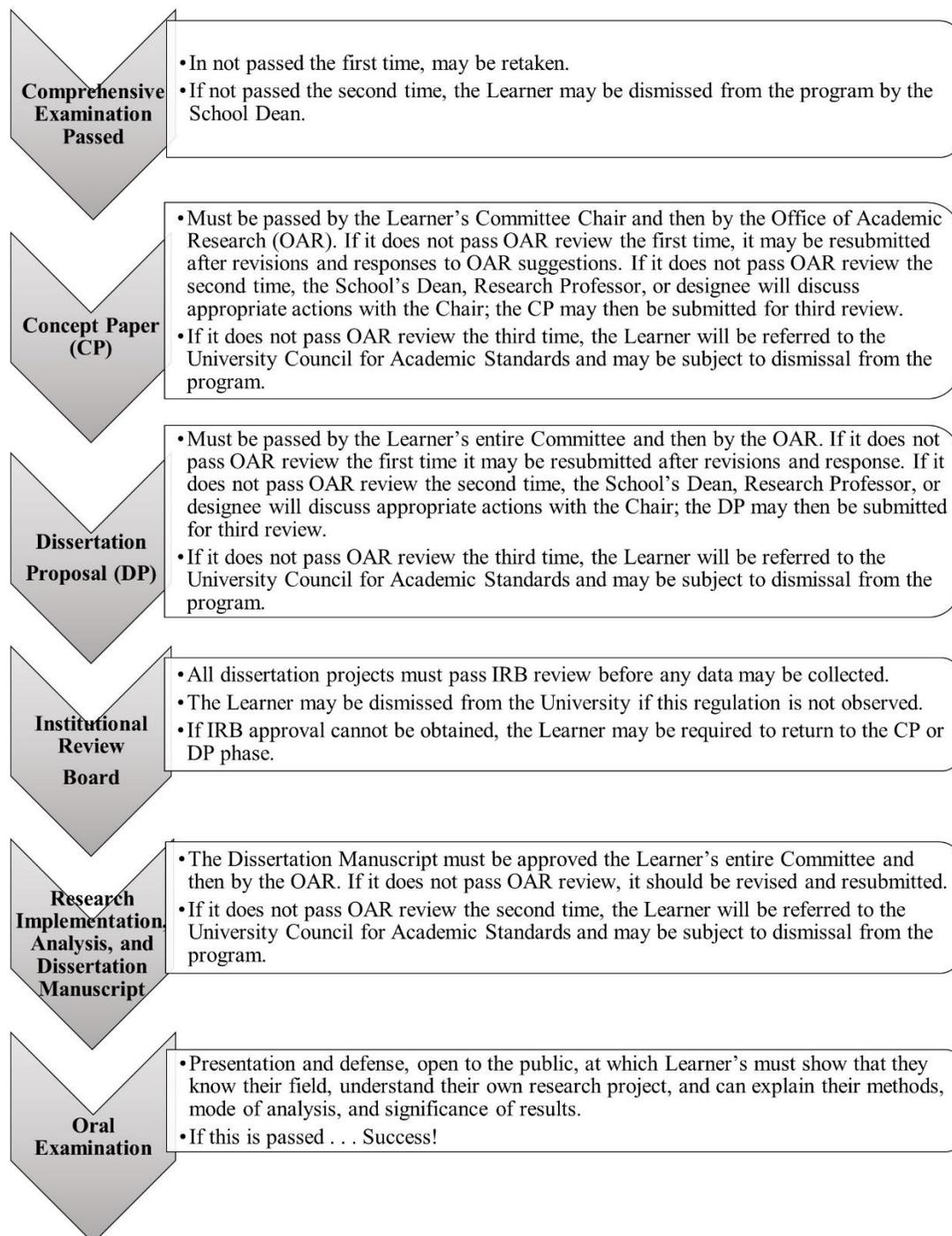|	n	%	M	SD
Non-structured Model Cohort (2013-2016)	182			
Gender				
Female	104	57.14		
Male	54	29.67		
Unreported	24	13.19		
Age			56.40	9.48
Ethnicity				
American Indian or Alaska Native	3	1.65		
Asian	4	2.20		
Black or African American	8	4.40		
Hispanic/ Latinx	7	3.85		
White	117	64.30		
2 or more reported	1	0.55		
Unreported	42	13.10		
Transition Cohort (2016-2017)	124			
Gender				
Female	71	57.30		
Male	38	30.65		
Unreported	15	12.10		
Age			56.70	9.55
Ethnicity				
American Indian or Alaska Native	0	0.00		
Asian	4	3.23		
Black or African American	11	8.90		
Hispanic/ Latinx	4	3.23		
Native Hawaiian or Other Pacific Islander	1	0.81		
White	63	51.01		
2 or more reported	4	3.23		
Unreported	40	32.31		
Sequentially Structured Model Cohort (2019-2020)	131			
Gender				
Female	91	69.47		
Male	40	31.03		
Unreported	0	0.00		
Age			51.23	10.13
Ethnicity				
American Indian or Alaska Native	0	0.00		
Asian	2	1.53		
Black or African American	22	17.10		
Hispanic/ Latinx	9	6.90		
Native Hawaiian or Other Pacific Islander	0	0.00		
White	66	50.40		
2 or more reported	6	4.60		
Unreported	26	20.05		

Measures

Program data were utilized to collect information on student graduation cohort, dissertation sequence, number of days enrolled in the doctoral program, and demographic data to reflect student characteristics (age, gender, ethnicity).

Dissertation Sequence Type

Prior to 2016, the university utilized a non-structured dissertation model which focused on completion of deliverables. This model reflected common stages used by most universities (i.e. 5 chapters). In 2016 the sequentially structured online dissertation model was implemented, and students who had already begun taking online doctoral courses transitioned to the new model. These students experienced both the previous non-structured model and the new sequentially structured model. Students who began dissertation courses in 2016 experienced only the sequentially structured online dissertation model.

Previous Non-Structured Model

Dissertation courses were 3 credit hours and lasted 12 weeks. Students were required to complete a minimum of 12 credit hours in dissertation courses but were allowed to continue taking dissertation courses until they had reached 7 years from their date of enrollment (in the program), continuing in these courses until oral defense was completed. If the 7-year deadline was reached without successful oral examination, the student would be dismissed from the program. In cases of extenuating circumstances, maximum time to completion could be extended by the Dean. The committee structure included 3 university faculty (1 chair, 2 members). There were 7 milestone deliverables for the previous dissertation sequence (see Figure 2): comprehensive exam, topic paper (abridged literature review, problem statement, purpose statement, and research questions), concept paper (CP; pre-proposal including problem purpose, RQs, research design, theoretical framework), dissertation proposal (DP; builds on CP with clear alignment, scope, more comprehensive literature review, and more developed methodological plan), Institutional Review Board (IRB) application and approval, dissertation manuscript (DM; 5 chapters), and oral examination (telephone, requiring a proctor to certify the student identity; PowerPoint of presentation sent to committee). In addition, specific milestones (CP, DP, DM) were critically reviewed and approved by an outside reviewer.

Figure 1

Non-Structured Model Dissertation Milestones

Comprehensive Examination Passed
- In not passed the first time, may be retaken.
- If not passed the second time, the Learner may be dismissed from the program by the School Dean.

Concept Paper (CP)
- Must be passed by the Learner's Committee Chair and then by the Office of Academic Research (OAR). If it does not pass OAR review the first time, it may be resubmitted after revisions and responses to OAR suggestions. If it does not pass OAR review the second time, the School's Dean, Research Professor, or designee will discuss appropriate actions with the Chair; the CP may then be submitted for third review.
- If it does not pass OAR review the third time, the Learner will be referred to the University Council for Academic Standards and may be subject to dismissal from the program.

Dissertation Proposal (DP)
- Must be passed by the Learner's entire Committee and then by the OAR. If it does not pass OAR review the first time it may be resubmitted after revisions and response. If it does not pass OAR review the second time, the School's Dean, Research Professor, or designee will discuss appropriate actions with the Chair; the DP may then be submitted for third review.
- If it does not pass OAR review the third time, the Learner will be referred to the University Council for Academic Standards and may be subject to dismissal from the program.

Institutional Review Board
- All dissertation projects must pass IRB review before any data may be collected.
- The Learner may be dismissed from the University if this regulation is not observed.
- If IRB approval cannot be obtained, the Learner may be required to return to the CP or DP phase.

Research Implementation, Analysis, and Dissertation Manuscript
- The Dissertation Manuscript must be approved the Learner's entire Committee and then by the OAR. If it does not pass OAR review, it should be revised and resubmitted.
- If it does not pass OAR review the second time, the Learner will be referred to the University Council for Academic Standards and may be subject to dismissal from the program.

Oral Examination
- Presentation and defense, open to the public, at which Learner's must show that they know their field, understand their own research project, and can explain their methods, mode of analysis, and significance of results.
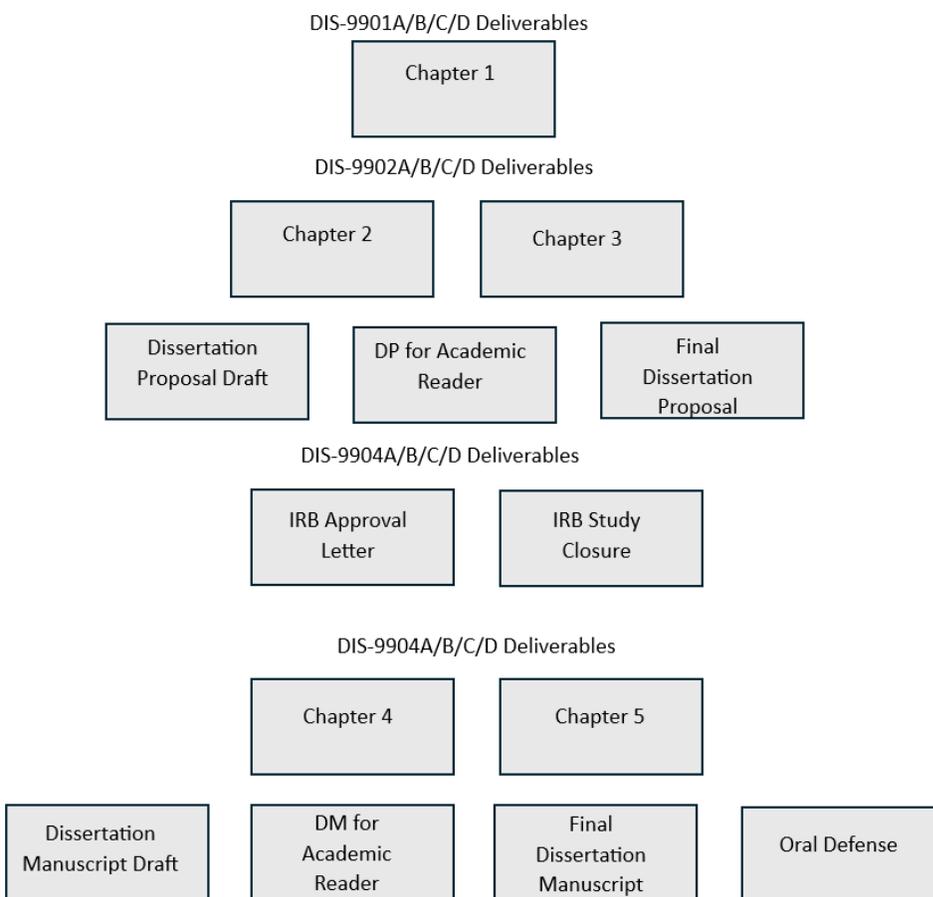- If this is passed . . . Success!

Sequentially Structured Online Dissertation Model

Developed by faculty and administrators of the university, this model incorporated accountability, quality engagement, and sequential scaffolding of academic skills and student dissertation progress. Online dissertation courses were 3 credit hours. Four blocks of courses are offered with each course block including 1 initial (A) 12-week course, and up to 4 supplemental (B, C, D) 8-week courses. Students were required to complete a minimum of 12 credit hours (A course in all 4 blocks) but if supplemental courses were taken, the required deliverable for each block had to be approved before the end of the supplement D course. If the deliverable was not approved, the student could be dismissed from the program.

The sequentially structured online dissertation model involved three broad stages: preparation and approval of the DP which included chapters 1, 2, and 3; conducting the study's research (IRB approval and data collection); and preparation and approval of the final DM (chapters 1-5), culminating in the dissertation oral defense. Within each course, students submitted progress on specified dissertation components to scaffold learning (course 1: chapter 1). This allowed for ongoing feedback, communication, and an iterative process of revision while constructing components of each chapter. Each chapter of the dissertation must meet minimum standards on an associated rubric, scored by committee chair and SME, for students to progress to the next course sequence block. At the DP and DM stages a third committee member, the Academic Reader (AR), also provides rubric-based evaluation. In this theory-focused dissertation process, the student identifies a researchable problem substantiated through evidence, proposes, and conducts original research.

Figure 2

Deliverables per Dissertation Course Block in the Sequentially Structured Online Dissertation Model

DIS-9901A/B/C/D Deliverables

Chapter 1

DIS-9902A/B/C/D Deliverables

Chapter 2   Chapter 3

Dissertation Proposal Draft   DP for Academic Reader   Final Dissertation Proposal

DIS-9904A/B/C/D Deliverables

IRB Approval Letter   IRB Study Closure

DIS-9904A/B/C/D Deliverables

Chapter 4   Chapter 5

Dissertation Manuscript Draft   DM for Academic Reader   Final Dissertation Manuscript   Oral Defense

Time to Completion

The outcome of interest for this study was number of days students were enrolled in the dissertation sequence of their online doctoral program. Although "enrolled days" is not always an accurate measure of time to completion due to critical life events that might cause prolonged absence (e.g., leaves of absence due to death, pregnancy, etc.), such cases are rare and cannot be controlled. It is reasonable to assume such outlying cases would randomly occur equally in both groups (traditional and sequentially structured). This variable reflected the number of days from a students' first vested dissertation course start date to the date of successful dissertation defense. In this sample scores ranged from 149-2426 days enrolled in the dissertation sequence (i.e., as a doctoral candidate).

Results

All analyses were calculated using SPSS 22.0 for Windows. Descriptive statistics were calculated to determine the mean scores of days enrolled in the doctoral program. The 182 participants in the previous non-structured dissertation sequence cohort ranged in days to dissertation completion from 303 to 2426 days (M= 1043.85, SD= 453.74). The 124 participants in the transition cohort ranged in days to dissertation completion from 255 to 2131 days (M=

942.80, SD= 460.72). The 131 participants in the sequentially structured model sequence ranged in days to dissertation completion from 149 to 1807 days (M= 760.90, SD = 371.67).

Time to completion scores showed unequal variance across groups; therefore, square root transformation was used to obtain equal variances. Levene's test showed that the variances for transformed time to completion scores were not significant, $F(2, 434) = 1.84$, $p = .159$, reflecting homogeneity of variance. A one-way analysis of variance showed the effect of cohort was significant, $F(2, 434) = 17.72$, p < .001. Cohen's D was calculated, and the effect size for this analysis (d = .68) was found to meet Cohen's convention for a medium effect (Lenhard & Lenhard, 2016).

Because cohort group sizes differed slightly, Gabriel's procedure was used to conduct post hoc tests. Results revealed days in the dissertation sequence were significantly lower for the current sequentially structured cohort (M = 26.79, SD = 6.60) compared to the non-structured model (M = 31.55, SD = 6.97) (p < .001; d = .70) and transition cohorts (M = 29.81, SD = 7.41) (p < .01, d = .43). The pairwise comparison of the non-structured model cohort and transition cohort was nonsignificant (p = .09).

Table 2

ANOVA Comparisons of Number of Days in Dissertation for Model Cohorts

				Gabriel's Procedure Comparisons	
Cohort	*n*	Mean	*SD*	Previous Model	Transition
Non-structured Model	182	31.55	6.97		
Transition	124	29.81	7.41	.09	
Sequentially Structured Model	131	26.79	6.60	< .001	< .01

Discussion

The purpose of the current study was to investigate how time to completion for non-clinical online psychology students in a sequentially structured dissertation model differed compared to the previous non-structured model and transitional model cohorts. Timely completion of the dissertation is beneficial in many ways for students, supervisors, programs, and universities (Álvarez-Montero et al., 2014; Ehrenberg et al., 2009; Wao & Onwuegbuzie, 2011). Prolonged dissertation completion can result in the research being outdated and therefore less relevant to the field, additional financial obligations, delayed career advances (Tuckman et al., 1990), and significant additional stress for candidates (Blum, 2010; Kelley & Salisbury-Glennon, 2016), without benefiting students with higher-quality job outcomes or more early career publications (Churchill et al., 2021; Ehrenberg et al., 2010). Perhaps more importantly, programs that emphasize timely completion suffer less attrition (Ehrenberg et al., 2009). Consequently, practices which encourage or support timely completion of great interest and value. Researchers have called for investigation of effectiveness of PhD models, including how

models impact outcomes such as time to completion, quality of dissertations, and building of research capability (Dominguez-Whitehead & Maringe, 2020). Therefore, it was considered necessary to create an online modality that supports timely student progress toward the completion of rigorous dissertation research and investigate the efficacy of this online model on specific time to dissertation completion outcomes. These results suggest a structured, high engagement, dissertation sequence positively impacts time to completion for non-clinical online psychology doctoral students in a context that supports quality dissertations (Author et al., 2020; Hussey et al., 2021). This model aligns with several aspects of transactional distance theory (Moore, 1997), but in ways that may not be immediately evident. Flexible course structure, support for regular quality engagement with the committee chair, and development of autonomy allows for less transactional distance between chair and student. While student autonomy is supported by the flexibility of each course within the sequentially structured online model, the sequential structure of the overall online model serves as a guidepost helping chairs to identify which students may need increased support (less autonomy).

The current findings are particularly interesting, in that the sequentially structured model cohort, which had significantly shorter time to completion compared to both other cohort groups, included doctoral students who graduated in 2019 and 2020. Many of those completing their dissertation in 2020 would have experienced additional challenges conducting research during the COVID-19 pandemic, delaying progress (Covington & Jordan, 2022; Soria et al., 2020). Other challenges such as home schooling children during school lockdowns and working from home had strong impacts on doctoral students (Boone et al., 2020; Levine et al., 2021) including increased anxiety and decreased dissertation productivity due to distractions, stress, and reduced motivation and ability to concentrate (Fraenza & Palerma-Kielb, 2022). These stressors may have been particularly salient for doctoral student mothers (Boon et al., 2020; Levine et al, 2021). In our sample, 69% of the sequentially structured model cohort were female. This may indicate that females were able to thrive within structure, scaffolding, and faculty engagement supported by the model, experiencing shorter time to completion despite pandemic disruptions that would arguably have had deleterious effects, especially for women. However, the current research should be extended to consider time to graduation for students experiencing the sequentially structured model when a largely female doctoral enrollment would not potentially be disproportionately impacted by parenting responsibilities in addition to stressors of a pandemic.

Research suggests up to 60% of graduate students regularly procrastinate academic tasks (Onwuegbuzie, 2004; Rahimi & Hill, 2021). Svartdal et al. (2020) suggest that poor self-regulation is a key contributor to procrastination that is amplified by a "procrastination friendly" academic environment. They also recommend the use of short deadlines whenever possible and focus on development of student self-regulation skills to support student success; higher levels of self-regulating learning have been linked with shorter time to completion for doctoral students (Kelley & Salisbury-Glennon, 2016). Song and Kim (2020) proposed that self-regulated learning can be scaffolded by facilitating graduate students' "planning, goal setting, self-monitoring, and self-evaluating processes, and to promote learners' motivation and use of learning strategies in online courses" (p .251). The sequentially structured model was designed to incorporate short-term scaffolded goals and to emphasize reflectiveness regarding student progress (among students and faculty). This model supports self-regulated academic progress reminiscent of

Ericsson's (1993) deliberate practice that leads to expert performance but also aligns with phases common to self-regulated learning models (Panadero, 2017): planning and goal setting; self-monitoring of effort and time management during task performance; and self-evaluating outcomes and progress, regulating and adapting to improve success. The weekly submissions embedded in the model support regular interaction with faculty, offering the opportunity to develop and maintain relatedness and connection, key psychological aspects of motivation supported by the theory and research surrounding self-determination theory (Ryan & Deci, 2017). Further, the weekly submissions reflect short-term goals (short deadlines) in addition to the intermediate deliverables (chapters of the dissertation) which are the focus of each course block. These chapter deliverables also reflect comparatively shorter-term successes that scaffold overall dissertation completion. In keeping with the core principles of goal theory, transactional distance theory, and previous research (Geven et al., 2018; Locke & Latham, 2002; Kelley & Salisbury-Glennon, 2016; Moore, 1997), it seems likely that implementing short-term and intermediate deadlines, fostering engagement with faculty, and supporting student self-regulation contribute to shorter time to completion for students in the sequentially structured model.

Results of the current study suggest that the sequentially structured online dissertation model presents a format to improve time to completion and produce quality dissertation work, while allowing open enrollment for online psychology doctoral students. As more higher education research students utilize online settings to complete their degree (due to demand or circumstances such as the COVID-19 pandemic), universities must implement best practices to support student success and support faculty in remote teaching. The current findings were limited in that only online psychology doctoral students who successfully defended their dissertation were included. Future research is needed to investigate the impact of this online model on attrition during the doctoral candidacy stage. Another limitation was that the researchers were unable to control for potential effects of students' stage of progress during transition to the sequential model. Future research would benefit from an investigation of the attrition frequency among the graduating cohorts and evaluation of dissertation success across individual level factors (i.e., demographics). Due to the archival nature of the dataset, the research was limited by the inability to consider demographics as covariates, as the multiple data sources did not link demographic data to outcome data. Recent studies have been inconsistent regarding socio-demographic factors, but suggest that gender, employment status, and funding may play a role in doctoral outcomes (Cornwall et al., 2019; Yusuf et al., 2020). Other research suggests near gender parity in time to dissertation completion for online doctoral programs (Chinta et al., 2019), although changes in dissertation chair did increase time to completion for women compared to men. Other US research found no gender differences in mental health, well-being, or work-life balance for doctoral students (Yisuf et al., 2020). Churchill et al. (2022) suggest improving educational outcomes for higher degree research students requires identification of modifiable factors linked with time-to-completion at an institution or program-level. For the online psychology doctoral program at this university, it could be valuable to identify socio-demographic factors which influence student's experience with the sequentially structured model. While socio-demographic factors may not be strengthened or encouraged within a dissertation model, understanding the role of student characteristics may help optimize structural supports of the model that interact with such variables.

Future research could focus on individual factors for success that may be strengthened or encouraged within the sequentially structured model. It remains unclear how a sequentially structured online dissertation model may affect the development of student non-academic characteristics (e.g., goal orientation, motivation, connectedness, mindset, perceived autonomy) that may have played a role in online doctoral student success or timely progression (Chao et al., 2017; Lake et al., 2018; Posselt, 2018; Rockinson-Szapkiw et al., 2016; van Rooij et al., 2021). It is imperative that future research determines how the sequential online model may foster student development of success-related skills and characteristics. Indeed, academic rigor and skill alone may be insufficient to prepare the student holistically to be competent, determined, motivated, and resilient in their goal pursuits (van Rooij et al., 2021; Posselt, 2018; Ryan & Deci, 2017).

Future research on models of online doctoral education should investigate development of conscientiousness and goal setting among students in a sequential model in contrast to traditional or alternative models. In addition to conscientiousness and goal-setting behaviors, variables related to student engagement with chair and institution, such as feelings of relatedness and belonging (van Rooij et al., 2021), should be explored in relation to student effort, focus, strategy evaluation and modification, and regimentation, or structure, all of which were factors that Ericsson (2018) identified among individuals who gained expertise in a skill set. Other research should investigate how engagement-related factors impact loyalty (e.g., student referrals) and goal-completion (e.g., dissertation success), given findings on the importance of peer and mentor relationships for the success and satisfaction of online doctoral students (Kumar & Koe, 2017; Pollard & Kumar, 2021; Torres et al., 2021).

Given the enormity of stress, trauma, and uncertainty facing a modern society struggling to normalize after a pandemic, it is important to develop new strengths in students on paths to earn doctorates, which may support career advancement, entrepreneurship, and social leadership. The sequentially structured online dissertation model appears to develop strengths in students through specific, deliberate goal-directed behavior energized by proximal goal setting (i.e., conscientiousness, goal-setting, motivated behavior), strategic guidance from a mentor (i.e., engagement, one-to-one teaching, co-understanding), progress evaluation and approach modification (i.e., feedback loops, reflection, and attenuation), and social support and community (i.e., relatedness, resourcefulness). There are implications from the current study that the online dissertation process can be improved to mutually benefit all stakeholders—students, faculty, staff, administration, alumni, and communities—while upholding the accessibility, flexibility, and access offered by online open-enrollment doctoral programs.

Conflict of Interest Disclosure
To the best of our knowledge, the named authors have no conflict of interest, financial or otherwise.

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