A Model for Developing Instructional Design Professionals for Higher Education Through Apprenticeship

Blending Theory and Practice

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In light of the growing number of instructional designers (IDs) of diverse educational and professional backgrounds in higher education, there is a need for formalized professional development programs. Currently no systematic pathway exists for equipping novice IDs with the requisite knowledge, skills, and experiences for successful performance and career growth. This article introduces the Development of Instructional Designers Apprenticeship (DIDA) model, comprised of four stages: (1) Observation and Modeling, (2) Tasks with Coaching, (3) Contextualized Practice, and (4) Reflection and Exploration. In this cognitive apprenticeship approach, an expert ID guides a novice through a continuum of tasks that graduate in level of difficulty over time. Case studies and sample tasks for each stage of development are provided as guides for implementation.

Instructional Designers (IDs) devise solutions for education and training that improve learning and human performance across many industries (Bannan-Ritland, 2001), including business, healthcare, government, and education. In higher education, the demand for instructional design expertise continues to grow (Kumar & Ritzhaupt, 2017) as institutions strive to provide flexible and on-demand learning formats for non-traditional learners (e.g., online certificates, blended and hybrid courses, flipped classrooms, and stackable credentials). There are currently 13,000 instructional design professionals working in US colleges and universities (Intentional Futures, 2016). This figure is expected to increase by at least 13% in the next decade (Kim, 2015).

The role of instructional design in academia is multifaceted and varies based on placement within individual schools, departments, or centers for teaching and learning. IDs serve as curriculum designers, managers, trainers, and support

specialists. They have a diversified and evolving skill sets, in the areas of soft skills, technical skills, project management, knowledge of learning theory, pedagogy, and instructional design (Ritzhaupt & Kumar, 2015). How IDs acquire the necessary skills and competencies for job performance, however, remains poorly understood (Ge & Hardré, 2010). Since few institutions confer degrees in instructional design or technology (Ashbaugh & Pina, 2014).Most IDs migrate into the field from other disciplines—as experienced faculty, administrators, technologists, librarians, and web developers— and require on the job training to equip them with the knowledge, practices, and identities central to design work (Manathunga, 2007).

Nonetheless, there is no systematic method for preparing new IDs to become experts in their profession once they are employed in academic settings. This has led to calls for scholarship addressing "a detailed examination of the progression from novice to expert practice by instructional designers" (Tracey & Boling, 2014, p. 658). Responding to the need for adequate on-site preparation for new IDs, we propose a professional development model grounded in the theories of cognitive apprenticeship (Collins et al., 1989) and situated learning (Lave & Wenger, 1990). This paper discusses the Development of Instructional Designers Apprenticeship (DIDA) Model, a developmental continuum to progress IDs from novice to expert in a series of four stages.

Preparation of Instructional Designers for the Higher Education Workplace

The instructional design profession, especially in the online environment, is still relatively new with no clear or common career path. There is no universal profile for IDs, as they are a highly educated and diverse group of professionals holding primarily masters' or doctoral degrees, some with formal credentials in teaching, instructional design, instructional technology, or media development. Others possess training in library science, graphic design, technical writing, and faculty development (Intentional Futures, 2016). In the workplace, IDs wear titles such as online learning support specialist, instructional technologist, learning designer, eLearning specialist, multimedia specialist, and instructional developer (Fong et al., 2017).

The International Board of Standards for Training, Performance, and Instructions (IBSTPI) (2012) provides instructional design competencies commonly referenced in business and industry training, instruction, and performance improvement. An area "characteristically unnoticed in recent history is the context of higher education and instructional design" (Kumar & Ritzhaupt, 2017, p. 371). As such,

the requisite competencies and skills required of IDs in higher education remain ambiguous and ill-defined. Recent reports have classified instructional design responsibilities into four general categories—designing, managing, training, and providing support to faculty (Beirne & Romanoski, 2018). Research examining instructional design practices note that IDs frequently support faculty subject matter experts in designing courses, conducting needs analyses, applying design/learning theories, and assessing program effectiveness. Ultimately, IDs serve students and aim to help them learn more efficiently (Kumar & Ritzhaupt, 2017). IDs must also be able to multitask, team-build, develop relationships, manage projects, and market instructional design services (Villachica et al., 2010).

Instructional design research has extensively documented the differences between expert and novice designers. In Sugar's (2014) meta analysis of instructional design, he notes that expert designers, unlike novices, recognize patterns, infer relationships between issues and solutions, disregard irrelevant information, and apply instructional strategies from previous experiences. Even when IDs are prepared in graduate education programs focused on instructional design, they often struggle to apply design models to complex cases, problem-solve under pressure, and adapt prescribed best practices for individual courses or programs (Stefaniak, 2017).

Due to their lack of preparedness (Tate, 2017) and the evolving nature of the field, many academic institutions that hire new IDs must supplement their formal education with specialized internal training, webinars, professional memberships, and conferences. The Online Learning Consortium, Quality Matters, Association for Educational Communications and Technology, and Educause are key providers of an ID's professional development.

Traditional Apprenticeship, Cognitive Apprenticeship, and Instructional Design

Before the advent of formal schooling, job-embedded learning through apprenticeship was the primary method for equipping professionals for the workplace. Traditional apprenticeship has been considered a natural way to learn, where "apprentices learn their field by watching and assisting a master of a trade or practice" (Dickey, 2008, p. 507). By the end of this interchange between expert and novice, the novice should possess the necessary knowledge, skills, and tools of the trade to perform their job function without assistance.

However, the affordances of apprenticeship extend beyond the mastery of physical tasks. It can aid in teaching novices the implicit mental models and habits of mind

of an expert (e.g., problem-solving, task analysis), through a process referred to as cognitive apprenticeship (CA). In CA, an expert's thinking is made visible to a novice by a series of instructional phases situated in an authentic learning environment, known as situated learning—modeling, coaching, scaffolding, articulation, reflection, and exploration (see Collins et al., 1989). Like traditional apprenticeship, CA focuses on learning through guided experience, with the goal of moving a novice to autonomy by gradually removing instructional supports.

Both traditional and CAs have been used to successfully prepare new professionals for a variety of career paths, including art, aviation, dentistry, education, engineering, law, medicine, and nursing, among others. Within education, novice-expert apprenticeship relationships can be observed in pre-service student teaching practicums, graduate teaching assistantships, and the postdoctoral continuum from student researcher to teaching scholar. In higher education, most research on CA has focused on teacher training programs, where they have been shown to positively impact educators' attitudes, instructional planning, technology use, and knowledge transfer (Denner & Burner, 2008; Dickey, 2008).

In the field of instructional design, apprenticeship has been identified as a promising pathway for helping new designers hone their craft and develop expertise through immersion in the process (Tracey & Boling, 2014). A cognitive apprenticeship instructional design curriculum was initially proposed by Ertmer and Cennamo (1995) as a classroom teaching model for fostering competency among graduate students. Their model outlined six levels of instructional activities aligned with the pedagogical features of Collins and colleague's (1989) CA framework. Activities encouraged individual and team problem-solving of simulated design cases and students provided the rationale for decision-making, while the instructor assumed the role of design expert and project manager. Although overall successful in teaching the principles of design thinking, the authors reported that the lack of realistic design problems was a limitation of the CA classroom experience.

Currently there are no documented examples of CA programs for IDs in the higher education workplace, although Ertmer et al. (2008) have recommended that novice and expert IDs be paired during the onboarding process to facilitate mentoring. One recent effort in this area is Penn State University and Educause's cross-institutional ID2ID program, where expert and novice IDs are partnered together for a 6-month period to informally share best practices and discuss common design challenges (Beirne & Romanoski, 2018). While early feedback from the peer mentorships has been positive, the program does not offer systematic professional development for IDs, as the content, experiences, and

direction of interactions is peer-driven (e.g., participants determine meeting frequency, topics, goals). It is also important to note that instructional design roles across institutions can significantly differ in scope and course development foci (e.g., online, residential, blended). Therefore, there remains a need for localized CA programming within individual learning design units to acclimate novice IDs to the instructional design role within the context of their specific institution.

Introducing the Model for Developing Instructional Designers Apprenticeship (DIDA)

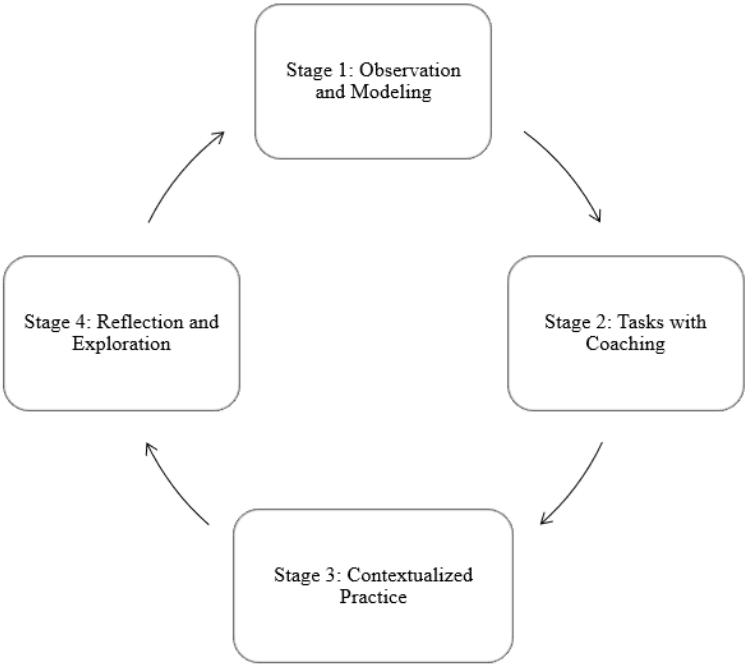
The Development of Instructional Designers Apprenticeship model (DIDA) is an extension of Ertmer and Cennamo's (1995) work on cognitive apprenticeship streamlined for the higher education workplace, rather than the classroom. It is a continuum of immersive tasks designed to foster competence among recently employed, novice IDs with little to no practical experience in design knowledge, practices, processes, and thinking. The professional background of a newly hired ID determines the starting point of the model, potentially at Stages 1, 2, or 3.

A primary assumption of the model is that IDs are embedded in an authentic context for learning as designers in the field of higher education. Situated learning is therefore the backdrop of the model rather than an isolated stage. Articulation refers to "any method of getting students to articulate their knowledge, reasoning, or problem-solving processes" (Collins et al., 1989, p. 482). At the heart of the model, novice IDs verbalize their thought processes with their expert ID mentor and members of the design team at their institution throughout each stage.

Figure 1 provides an overview of the 4 stages of DIDA: (1) Observation and Modeling, (2) Tasks with Coaching, (3) Contextualized Practice, and (4) Reflection and Exploration. These stages can be iterated or extended based on the needs of the entry-level ID or institution. An institution might align the stages of DIDA to their provisional period of employment.

Figure 1

Stages of the Developing Instructional Designers Apprenticeship Model



The DIDA stages encompass pedagogical features relevant to the development of an instructional design professional. A high-level description of each of the stages follows. A full summary of tasks for the DIDA process can be found in Appendix A. It is not an exhaustive list but provides a foundation that may be customized according to the needs of the institution.

Stage 1: Observation and Modeling

Provides multiple opportunities for the novice ID to engage in peripheral observation of experienced instructional design practitioners at work. *Observation* is key for exposing the novice to the "implicit cognitive strategies and rules-of-thumb [that] heavily influence the design process" (Kirschner et al., 2002, p. 87).

Ertmer et al. (2008) highlight that the heuristics of expert IDs cannot "be found in an instructional design textbook but [are] much more idiosyncratic and drawn from the unique collection of previous experiences" (p.28), like those of a seasoned ID. Witnessing the process of real-world problem-solving (successes and failures)

in its entirety is necessary for building the novice's experience base.

Similarly, *modeling* entails explicitly demonstrating the behaviors and cognitive processes used by experienced designers. Here, expert IDs employ think-aloud (Perez & Emory, 1995) or design-aloud protocols to model foundational knowledge, patterns of thinking (e.g., analyzing ill-structured problems), and concrete design skills for the novice to try in the future (e.g., creating a course map). Through ongoing communication, experts verbally articulate their approach to a design problem (e.g., determining the scope and sequence of a unit), teaching the novice to think and act as a professional designer (Ertmer & Cennamo, 1995).

Sample observation and modeling experiences may include:

- Observing course authoring in the Learning Management System (LMS) environment.
- Modeling the process for developing course development timelines and milestones.

Stage 2: Tasks with Coaching

Focuses on experienced IDs coaching the novice through basic design tasks, while gradually decreasing their level of support. *Coaching* is the "one to one process of helping others to improve, to grow, and to get to a higher level of performance, by providing focused feedback, encouragement and raising awareness" (Pousa & Mathieu, 2010, p. 3). Here the expert ID "coach" pushes the novice to actively demonstrate the knowledge that they have acquired from the observation and modeling stages (Ertmer & Cennamo, 1995).

Expert practitioners may assist with organizational skills and goal setting, in addition to probing the novice to justify their design decision-making, helping them recognize flaws, and providing advice on alternative solutions when appropriate. Coaching interactions may consist of question and answer sessions, timely debriefings, and explanations as the novice begins acquiring structured, hands-on experience in the field.

Sample coaching tasks may include:

- Complete a MOOC on copyright, higher education pedagogy, web accessibility, or project management and design deliverables that apply the concepts.
- Outline a faculty development session on an emerging educational technology. Receive feedback on strengths and areas of improvement with

an experienced ID.

Stage 3: Contextualized Practice

Involves moving the novice ID toward independent and applied problem-solving in complex, authentic situations. Here the novice moves from designing individual elements of a project (e.g., tasks) to entire projects, applying design principles in an iterative and context-driven environment (Tracy & Boling, 2014).

Work in this stage is based on Vygotsky's (1978) Zone of Proximal Development (ZPD), which contrasts the problem-solving abilities of a learner with and without the guidance or collaboration of a more capable expert. The term 'proximal' emphasizes skills that a novice ID is close to mastering, but that require some scaffolding. Common scaffolds include models, templates, and resources that provide structure (e.g., copyright flowchart for guiding copyright decision-making) as the expert ID's support wanes.

The experienced ID provides design problems at an appropriate level of complexity for the novice that are meaningful, attainable, and incorporate a level of desirable difficulty. Opportunities may entail actual problems faced by the design team, such as re-designing ambiguous assignment instructions based on student feedback or assessing a new learning technology for web accessibility. The novice strives to address use cases by offering a range of potential solutions and seeking feedback from their expert counterpart. To monitor progress and promote growth, the expert's feedback should be goal-directed, timely, actionable, balanced, and ongoing (Wiggins, 2017).

Sample contextualized practice opportunities might include:

- Develop a new course syllabus that demonstrates instructional alignment and clear policies.
- Review an existing course design and offer recommendations for enhancing interaction.

Stage 4: Reflection and Exploration

Entails the self-assessment of past, present, and future instructional design professional development. At this final and ongoing stage, the novice ID has already acquired foundational skills and now applies a critical lens to their design decisions with an eye toward continuous improvement. In his analysis of professional growth, Schön (1983) distinguishes between reflection *in* action and reflection *on* action. Reflecting *in* action involves the novice ID actively thinking

about decisions as they are made, while reflecting *on* action occurs after the event, transitioning them to achieve a higher level of understanding. In the reflection *on* action process, the novice ID compares their completed designs to expert examples, bringing together theory and practice. Reflective journaling or blogging are common strategies to promote reflection. The following prompts could be addressed in these entries (Ambrose et al., 2010):

- What did you learn by completing this project?
- What questions do you have?
- What would you do differently?
- How have your skills evolved?

Exploration is the natural fading of supports as the novice ID takes responsibility for their learning (Collins et al., 1989). In this stage, the expert ID transitions from coach to mentor for the purpose of helping the novice advance their career beyond the resources and skills of the design team. Mentorship supports lifelong learning, which is a prerequisite for the instructional design profession, as it is constantly evolving and making use of emerging technologies.

Examples for exploration might include:

- Generating a list of short and long-term professional development goals
- Becoming a member of a professional association

Applying the DIDA Model: A Case Example

As all learning design units differ in structure (Vu et al., 2016), the following case study presents one instance of how the model might be applied in practice.

Consider Central State University (CSU) a large, research 1 institution with a centralized Center for Teaching Excellence (CTE) of ten years directed by Dr. Deshane Stephens. A team of eight IDs and technologists supports faculty in the design, development, and delivery of online and hybrid courses. Services include consulting on curriculum design, faculty development on pedagogy, technology integration, multimedia production, and quality assurance.

With levels of experience in higher education and online learning varying from two-10 years, the team is well-positioned to implement mentorship programs like DIDA, as several team members are senior-level IDs and can fulfill the role of expert ID in the model.

CSU adheres to a six-month provisional period for evaluating new employees. Each

employee's performance is also reviewed annually. At the CTE, new employees are onboarded with the DIDA model. The model is adapted according to the new hire's level of experience. The Center recently hired two new IDs, Graduate Greg and Corporate Carmen.

Graduate Greg

Graduate Greg completed his Master's in Instructional Design at CSU and was employed as a student worker at the CTE for one year prior to accepting his new role. He is familiar with the Center's practices and processes but was hired as an entry-level designer because he lacks real-world design experience.

Corporate Carmen

Carmen comes to the CTE with eight years of corporate banking instructional design expertise. She specialized in developing training materials for online delivery. Her most recent projects include sexual harassment, diversity in the workplace, and communication. She lacks experience in collaborating with subject matter experts, learning management systems, and the culture of higher education.

Given their differing backgrounds, Dr. Deshane has proposed that Graduate Greg begin the model at *Stage 1: Observation and Modeling*, while Corporate Carmen begins at *Stage 2: Tasks with Coaching*.

Understanding that full completion of the DIDA model may extend from months to years for an individual employee, Dr. Deshane has proposed the following timeline to align some DIDA developmental tasks with the six-month provisional period. The following tables depict the same task scaffolded at multiple stages to illustrate the progression of the model (see Tables 1 and 2).

Table 1

Graduate Greg

Concept	**Months 1-2**	**Months 3-4**	**Months 5-6**
	Stage 1: Observation and Modeling	Stage 2: Tasks with Coaching	Stage 3: Contextualized Practice

Alignment	Observe expert ID create a course map that **aligns** learning objectives, activities, and assessments for a lesson.	Review an existing lesson for the **alignment** of learning objectives, activities, and assessments; Discuss observations and recommendations with expert ID.	Create a course map that **aligns** learning objectives, activities, and assessments for a lesson; Receive feedback from expert ID.
Subject Matter Expect (SME) Collaboration	Observe how expert ID facilitates a course development meeting with **SME** or faculty member.	Develop an agenda and supporting materials for a course development meeting with **SME** or faculty member; Discuss plans with expert ID.	Co-facilitate a course development meeting with expert ID and **SME** or faculty member.

Table 2

Corporate Carmen

Concept	**Months 1-2**	**Months 3-4**	**Months 5-6**
	Stage 2: Tasks with Coaching	Stage 3: Contextualized Practice	Stage 4: Reflection and Exploration
Course Development Timelines	Collaborate with expert ID to create course development **timelines** on a variety of courses.	Draft course development timelines for simple to complex courses; Compare proposed **timelines** to actual timelines produced by expert ID.	Reflect on similarities, differences, and best practices in the production of course development **timelines;** Consult with expert ID.

Accessibility	Complete a workshop or MOOC on developing **accessible** digital materials; Meet with disability services specialist and expert ID to discuss barriers faced by online students with disabilities.	Create documents (e.g., Word, PowerPoint, and PDF) using accessibility checkers and applying ADA web **accessibility** compliance; Discuss with expert ID.	Create a matrix reflecting on the best practices in **accessible** course design and noting the impact/effort of each practice; Discuss matrix with expert ID; Identify areas for additional training.

The goal of varying Graduate Greg and Corporate Carmen's development timelines applies the concept of personalized learning for professional development.

Discussion

The DIDA model was developed in response to the need for a detailed professional development pathway for novice IDs in higher education (Tracey & Boling, 2014). Unlike other academic roles, such as faculty and administrators, career growth for IDs is poorly defined. Coming from diverse backgrounds, many novice IDs are unaware of the competencies, opportunities, and tools of the trade needed to progress within their organization or the broader field of design. Each stage of DIDA helps to address this gap by providing novices with concrete ways to acquire the abstract knowledge and skills of an expert practitioner. Novice IDs benefit from the natural progression of the cognitive apprenticeship and increasing complexity of tasks beginning with *observation and modeling,* followed by *tasks with coaching*, *contextualized practice*, and ending with *reflection and exploration*.

One critically important feature of the DIDA model is its flexibility to be transferred across institutions and customized according to departmental structure and needs. The four stages of DIDA outline an iterative, rather than linear, process with multiple entry points for novice and semi-experienced IDs from non-academic contexts as illustrated in the cases of Graduate Greg and Corporate Carmen. Based on expert ID monitoring of progress, novice IDs can revisit entire stages or tasks within stages as needed. The task list, however, is not exhaustive or prescriptive and can easily accommodate advancements in educational research and technology (e.g., neuroeducation, changes to LMS). While the model was developed for IDs, it provides a foundation that can be modified for related fields such as instructional technology and faculty

development.

The effective execution of the DIDA model relies upon several key factors, most importantly the availability of an expert ID, who can curate resources (Appendix B) and oversee the apprenticeship. DIDA would be best implemented in a mature design team setting with multiple experts to serve as coaches and mentors. As the expert and novice IDs maintain a close and ongoing relationship throughout the DIDA stages, administrative support is necessary for human resource allocation. The significant time commitment required of the expert ID may range from months to years. Therefore, administrators may consider adding apprenticeship responsibilities to the expert ID's job description. They may also distribute the expertise of senior team members across the stages, pairing the novice ID with multiple expert IDs. In addition to distributing the workload of instructional design development, expert IDs likely have different design specializations (e.g., copyright, accessibility, assessment) to share with the novice ID.

The DIDA model offers opportunities for future research on the training and development of IDs in higher education. Next steps might include piloting the DIDA continuum of tasks in partnership with several institutions of varying size and complexity. Collaborative feedback from partners could help to refine the most effective practices for instructional design development and confirm timelines for task completion. Ideally, new tasks would be identified and added to the model. Expert IDs' tracking of novices' progress across the four DIDA stages would provide documented examples of instructional design growth and the unique professional development pathways to expertise in the field. Case studies would be useful in exploring the application of DIDA. They might focus on comparing novice IDs of differing entry levels, team structures (e.g., centralized or decentralized), or delivery modes (e.g., face-to-face, online, hybrid). Further research could also involve developing tools to evaluate novice ID progress at varying stages (e.g., surveys, rubrics, self-assessments, interview protocols).

In conclusion, as higher education continues to experience an influx of novice IDs, greater attention is needed for organizing their professional development. The DIDA model provides a working framework for developing the knowledge and skills of the novice ID by utilizing internal resources.

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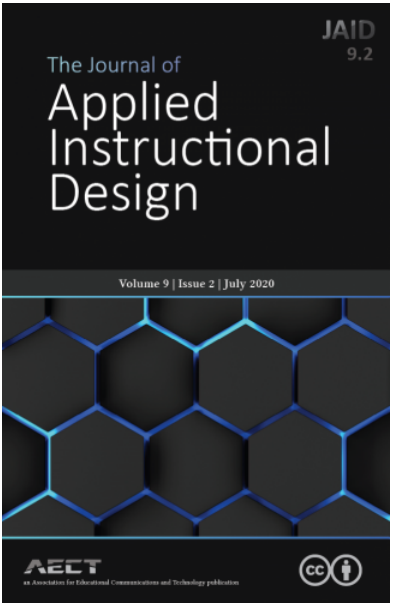

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