Waiting and Help-Seeking in Math Tutoring Exchanges

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Laboratory work is used for developmental math more frequently than for English or reading.

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ABSTRACT: Drop-in peer tutoring is the most popular model on college campuses, but a high student-tutor ratio suggests that students will spend the majority of their lab time working without the aid of a tutor. This study observed students in a drop-in tutoring center serving developmental math students and explored what they do in that independent time. The ethnographic research method identified five distinct student types, distinguishable by their behaviors, help-seeking strategies, and participation in tutoring exchanges. The analysis reviews both the form and function of these distinct typographies, considers students' needs for learning and student services, and makes recommendations for tutors and managers.

Research demonstrates that students' course behavior predicts learning and success (Li et al., 2013), but how does it manifest in a tutoring situation? Though classroom instruction takes many forms, tutoring is generally individualized. Most tutoring literature is concerned with tutoring exchanges, but casual observation in the drop-in math lab suggests that the student-tutor ratio will create an imbalance of time spent being tutored versus working independently. If students spend most of their time working without the aid of a tutor, what are they doing in that time? There are no studies to date about how students utilize the time between tutoring exchanges; this article seeks to address that gap by categorizing their behaviors in the drop-in lab.

Teachers are frequently unable to provide enough wait time or think time (Lerman, 2014) though it has been proven to be important for learning (Bransford, Brown, & Cocking, 1999). However, it is abundant in tutoring labs, where students work independently as well as with tutors. Describing and understanding how students utilize lab time is an important step in determining how to facilitate more effective use of it. Waiting causes anger and uncertainty (Houston, Bettencourt, & Wenger, 1998), but learning happens best in a state of "relaxed alertness" when students are stimulated and engaged, but not overly anxious or agitated (Caine, Caine, McClintic, & Klimek, 2009). In the lab, are students *waiting* for tutoring services, or *thinking* as they work independently and productively? How do they initiate the tutoring interactions in that time?

As colleges simultaneously receive more students needing developmental math and are under increased scrutiny to move them through the curricula efficiently and effectively (Center for Community College Engagement, 2016), tutoring services play an instrumental role in student learning and success. This article uses participant observation in the drop-in math tutoring lab to describe how students study independently, ask for help, and interact with tutors. The analysis provides insights and implications for tutors, faculty, and administrators who manage these spaces.

Context

Tutoring centers are staples on college campuses, particularly at community colleges. Gerlaugh, Thompson, Boylan, and Davis (2007) estimate that tutoring is available in 89.3% of community college developmental education programs, and that it has increased by 25.6 percentage points from a decade prior. Concomitantly, rates of developmental education enrollments are rising (Greene & Winters, 2005; Kobrin, 2007; Skomsvold, 2014). As the concept of college readiness is more nuanced than standardized tests can represent (Boylan, 2009; Fay, Bickerstaff, & Hodara, 2013; Hodara & Cox, forthcoming; Karp & Bork, 2012), and cut scores for college coursework vary widely and by campus (Fields & Parsad, 2012), estimates of the numbers of students needing developmental education vary widely depending on the method used to determine "readiness." Regardless, enrollments are growing, particularly in math (Horn, Nevill, & Griffith, 2006).

Tutoring and Developmental Mathematics

The prevalence of tutoring programs is supported by literature documenting their impacts. Thirty years ago, Cohen (1985) posited the major difference between developmental and college math is in instructional methods and staffing and identified the tutoring lab as one of the features that distinguishes developmental math. Tutoring is effective for developmental students' learning (Fullmer, 2012), academic success (Cooper, 2010; Gallard, Albritton, & Morgan, 2010) and longitudinal retention and graduation (Gallard et al., 2010; Rheinheimer, Grace-Odeleye, Francios, & Kusorgbor, 2010).

Though tutoring is a valuable student success and retention strategy, there are many academic support practices that fall under the general designation of "tutoring." Some variety in tutoring models is likely attributable to administrative responsibilities and variable costs of delivery. Gerlaugh et al. (2007) note that laboratory work is used for developmental math more frequently than for English or reading, and individualized instruction is more prominent in math than other disciplines. Of all math tutoring models, drop-in peer tutoring is the most popular (Perin, 2004; Perkin & Croft, 2004). Yet the available literature focuses on the correlation between tutoring and course- and institution-level outcomes, and little examines the lab itself.

Help-Seeking

Effective academic help-seeking is critical for learning and academic success. Zimmerman (1990) advanced the concept of the self-regulated learner as an academic ideal; this role requires knowing one needs help (metacognition), deciding to get help (motivation), and asking for it effectively (behavior). This sequence is a complex social interaction, and the dynamic is not entirely academic (Good, Slavings, Harel, & Emerson, 1987). Because it exposes social and intellectual vulnerabilities (Ryan & Pintrich, 1997), effective help-seeking requires students to not only have the metacognitive skills necessary to describe their own learning but also a positive self-concept (Arbreton, 1993). These cognitive and psychosocial processes manifest behaviorally. Students with strong self-efficacy are more able to use help-seeking strategies effectively (Ryan & Pintrich, 1997), and those with low self-efficacy avoid asking for help (Ryan, Gheen, & Midgley, 1998). These tendencies are also the result of experience; passivity is a learned response for low-achieving students (Good et al., 1987). These circumstances explain the observed paradox in math instruction: students who most need help do not ask for it (Ryan & Pintrich, 1997).

In addition to the influence of self-esteem and cognitive skills, personal learning goals will govern whether students seek help and the type of help they seek (Ryan et al., 1998). Students with intrinsic learning goals are likely to seek help that promotes understanding of processes, whereas those with ability or performance goals–those intended to validate ability or avoid demonstrating lack thereof (Grant & Dweck, 2003; Offer, 2007)–are more apt to focus on product-oriented help, or to avoid help-seeking entirely (Arbreton, 1993).

The literature focuses on help-seeking behaviors in the classroom where instruction is delivered. The math lab, as a complement to the classroom, likely has similar dynamics. Students' choice to attend a voluntary math lab environment suggests both interest in learning and openness to receiving help. Thus, understanding how self-identified help-needers go about seeking (or not seeking) help in the open math tutoring lab begs further exploration. If the act itself is the product of social, cognitive, and environmental factors (Karabenick & Knapp, 1991), observing students' help-seeking behaviors may provide insight to their internal processes.

Methods

Ethnographic inquiry operates on the premise that people engage in explicit and implicit behaviors, and structured observations can yield data that could not be ascertained in interviews or surveys. Spradley (1980) notes, people do not simply interact with things or objects. Rather, their behaviors display symbolic significance; meaning is found in social interactions and is itself an interpretive process. As such, he notes that individuals are frequently unable to accurately describe their own behavior. Extrapolating these principles to the math lab, students often lack vocabulary around math and metacognitive strategies that describe their processes, and the meaning of their behavior can thus be better ascertained and intuited from observation.

> *Structured observations can yield data that could not be ascertained in interviews or surveys.*

Data for this form of inquiry is collected through participant observation, during which researchers spend extended time periods in a social setting, observing and recording activities and interactions. The extent to which researchers can participate in those activities is dependent on the setting and the researchers' insider/outsider status and has bearing on the data collection and analysis (see Bonner & Tolhurst, 2002; Labaree, 2002). The research team consisted of the learning center coordinator, the math lab manager, and a developmental education faculty member. All team members had familiarity with the student population and had experience as tutors ourselves and blended insider and outsider perspectives. Our varying familiarity with the tutors, students, math curriculum, and lab protocol gave each researcher a unique perspective, which we identified through bracketing and dialogue (a process for mitigating bias and preconceptions; see Tufford & Newman, 2012). These differing frameworks facilitated a more thorough analysis.

Each member conducted observations independently and at different times during the day and periods in the semester. To begin each observation, we sat in a corner of the lab and observed the first student to walk through the door. We recorded his or her activities until he or she left the lab. As the study met the conditions for exemption of informed consent per IRB review, neither the study nor its objectives were communicated to students or tutors, though we were forthcoming if asked. Our use of paper for note-taking and body positioning assumed the posture of a student studying, and students seemed unaware that they were being observed. Though the tutors usually recognized our presence, they did not inquire about what we were doing in the lab, and students generally ignored us. We are confident that our observations were representative of typical lab conditions.

This study employed Spradley's (1980) method of participant observation and data analysis, which is executed iteratively and in three phases, each designed to refine data collection. The first phase of observations were *descriptive*, wherein we sought to record all participant behavior and to describe it within a question matrix that recorded the physical space, objects within it, acts, activities, events, and participants each in relation to one another. This phase of observation took place over a period of 6 months, during which time we spent approximately 95 hours watching students in the lab. Over this period, we reviewed and discussed observation notes to create a domain analysis describing emerging patterns and creating preliminary categories of student behavior.

The second phase consisted of *focused* observation, which refined the preliminary categories, describing them more fully and using structural questions to identify the semantic relationships within them. These data were collected over a period of 6 months and included approximately 45 hours in the lab. In this phase of observations and extensive conversation that guided the analysis, we identified five discrete student types and used field notes to describe their identifying characteristics, use of physical space, independent time in lab, help-seeking behaviors, question types, and behavior in tutoring interactions. We further noted how tutors behaved with each student type, the function of the observed behaviors, and the impact of the behaviors on other students in the tutoring lab.

The third and final stage consisted of *selective* observations: We took the developed taxonomy into the lab and continued observations to verify categories and to ensure that findings aligned with student behaviors. We more clearly stated how categories differed from one another and adjusted the taxonomy incrementally. On several occasions, two of us were able to observe the same student at the same time and to later discuss behaviors in the context of the study. This, along with descriptive notes, allowed us to confirm agreement between observers when applying the taxonomy to specific student behaviors.

Setting and Demographics

Data were collected at the math lab at the Learning Resources Center (LRC) at the University of Alaska Anchorage (UAA). UAA is a large, open-enrollment institution serving 17,000 students and offering certificate, associate, baccalaureate, and graduate degrees. As a university with a community-based mission, it serves a diverse student population: 44% of the student body is over the age of 25, 36% of students self-identify as non-White, and 53% of students attend part-time. Initial math placement is determined by ACT, SAT, or ACCUPLACER scores, and, per these metrics, the vast majority of incoming students are recommended for developmental math. The math lab at UAA is primarily focused on tutoring developmental math students taking pre-, elementary, and intermediate algebra.

As a CRLA level 1 certified lab, tutors are hired based on academic performance in math classes and interpersonal skills. They attend regular trainings on pedagogical and communication strategies as well as administrative topics like FERPA and safety. Roughly a dozen tutors are employed each semester, many of whom tutor throughout their undergraduate enrollment, allowing us to observe tutors with a wide range of experience. The math lab provides drop-in tutoring services for 66 hours per week, which includes evening and weekend shifts. Though rarely full to capacity except around midterms and finals, the lab can accommodate 30 students. It also has computer and web-based resources as well as a collection of texts, games, and other supplemental math learning materials. The lab staffs at least two tutors per shift, with three or four tutors working during busy periods.

Findings

The observations and analysis identified five student types, which are distinguishable from one another by the different ways they occupy their space, work independently, seek help, and interact with tutors as well as the function of their behavior. The students we observed seemed to represent the array of demographic features (race, age, and gender) that make up the campus. Though the data do suggest that some student types are more commonly represented by one gender over another, we did not observe enough students to determine correlation between demographic features and student type. For readability and clarity in this article, students are represented with the masculine pronoun or possessive adjective (he/his), and tutors with the feminine equivalent (she/her). Table 1 provides an overview of student behaviors, organized as descriptive archetypes.

Dependent

The most prominent student in the lab is the dependent student. He comes in alone, and does not sit with other students. In the lab, he uses big, exaggerated gestures that seem intended to draw attention to self, such as loud sighs, flopping back in the chair, or loudly shuffling and rearranging papers. The dependent student occupies a large footprint in the lab: He spreads belongings across a table and usually sits directly in front of the tutor desk, facing tutors with a direct line of sight.

The dependent student spends most of his lab time directly interacting with the tutor. He asks for help directly; if the dependent student does not quickly catch the tutor's eye, he raises his hand or walks up to her and asks for help. If the tutor is engaged with another student, the dependent student stops working, keeping his hand raised and looking at the tutor until she comes to help. On occasion, the dependent student will interrupt another tutoring session to request help.

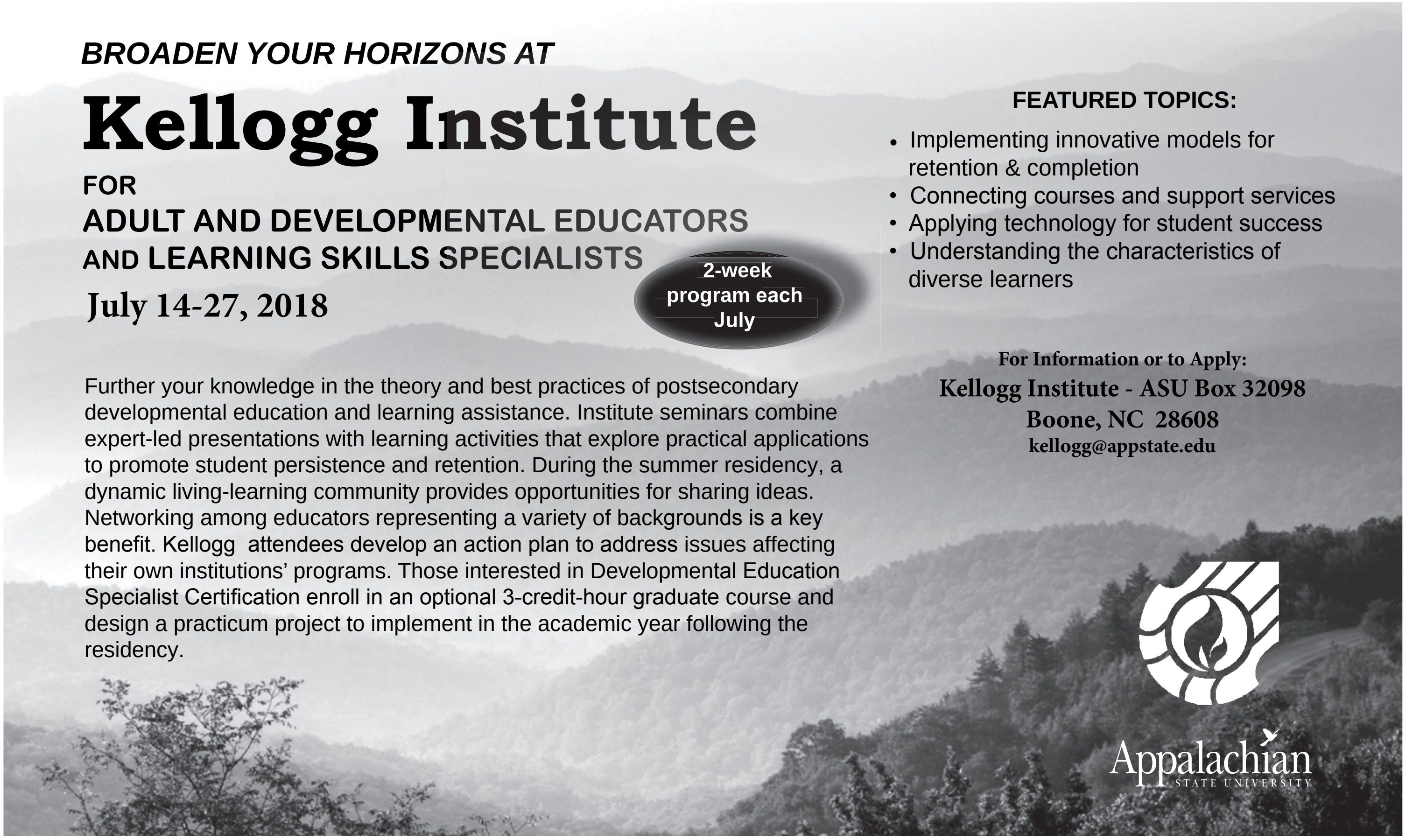
The dependent student asks for help in solving specific problems, rather than conceptual or process information. He responds to tutor instruction with nonelaborated comments (e.g., "Oh, that's weird.") but does not engage in discussion of mathematical concepts. Usually, the tutor will work with the dependent student through an entire problem, start to finish; upon completion, the dependent student is ready with "just one more question." Even though the next problem may be similar to the one they just solved together, the tutor generally works through the problem with the same level of support and assistance. The dependent student usually monopolizes tutor time to work through three problems, and each time the tutor walks him through the whole problem, standing over him and checking for correctness. The dependent student seems to like it when tutors are with him and keeping him on track.

Table 1

Math Lab Student Typographies

	Dependent	Scrambling	Statue	Industrious	Social
Identifying behaviors	Sits alone, facing tutor desk; occupies large footprint; large, exaggerated gestures	Appears around deadlines; sits alone with back to tutors; disorganized	Appears around deadlines; spreads out materials; sits still	Sits with back to lab; serious affect; brings textbook and supplemental materials; undistracted	Sits with others; loud talking and laughter, initiates conversations with tutors and students
Alone time in lab	Does not work independently; takes bathroom breaks, makes phone calls, copies from textbook	Copies problems; looks at cell phone; flits between textbook and notebook	Sits statue-esque with pencil poised above paper; does not write or work problems	Works on math problems; consults texts, computers, and other materials	Rarely alone; seeks to engage students or tutors in conversation
Help-seeking strategies	Raises hand high or walks up to tutor directly	Does not request help; emits frustrated sighs	Does not request help; sits still	Requests help after exhausting other resources; raises hand or makes eye contact	Exchanges platitudes; compliments tutors; engages in conversation
Tutoring exchanges	Requests help for specific problems; following explanation is poised with "just one more question"	Interactions rare; usually declines help if offered; states needs to "catch up"; unable to focus on tutor explanations	Interactions rare; when help is offered, listens to tutor, but does not participate in interaction	Requests procedural help on specific problems; stops tutor with questions or to try it independently	Conversational; focused on math or college-knowledge information

Note. Behaviors of students in the developmental math drop-in tutoring lab demonstrate unique learning needs and help-seeking strategies.



Though the dependent student frequently spends long periods in the lab (usually an hour or more), he spends little time working independently. In between direct requests for help, he leaves the lab for brief periods (such as a bathroom break or to make a phone call). After receiving help from the tutor, he does not move to a similar problem, study materials, or try to complete work independently. Instead, he copies problems from the book onto his paper, flips pages back and forth in the book without reading them, or reads word problems aloud to himself. This behavior seems to be a show of putting in time between asking tutors for help with problems.

The function of these behaviors seems to be a conscious or unconscious manipulation of tutors into over-helping. As tutors have more interactions with the dependent student, they are worn down, giving less instructive help and more nonelaborated responses. Especially when other students in the lab need attention, tutors will rush to end the long interaction by completing the majority of the dependent student's work for him. Much of this happens because the dependent student does not have the conceptual foundation to do the work at the level that has been assigned. For example, as a dependent student was trying to graph a linear function, the tutor showed him how to solve for y (2x = y) by substituting x with actual values. As the tutor changed the problem (2x = 2), she asked, "What multiplied by 2 equals 2?" and the dependent student was unable to perform the more simple algebraic substitution. Thus without foundational knowledge, the only way for him to complete the more complicated homework problems was to be over-helped. Dependent behavior thus serves as a compensatory strategy; the short-term goal of assignment completion is actualized at the expense of meaningful learning at the appropriate level of challenge. Resultantly, these lengthy interactions limit tutors' interactions with other students.

Dependent behavior thus serves as a compensatory strategy.

Scrambling

The scrambling student appears towards the end of the semester or before major exams but is not a regular presence in the lab. The scrambling student sighs a lot and is usually unorganized (e.g., papers are falling out of notebooks) or unprepared (eg, does not have a pencil and asks to borrow one). The scrambling student usually sits with his back to the tutors and does not interact with other students in the lab.

The scrambling student spends short stints in the lab and does not request help from a tutor. He shuffles papers and flips pages in the textbook and frequently picks up a cell phone or other distracting items. The scrambling student may copy problems but does not work them. His movements are rapid–flitting between the textbook, cell phone, and paper–but he does not focus attention on any of these items for very long.

The scrambling student does not generally ask for help, though his sighs and frustrated demeanor may attract tutor attention. If the tutor walks by the scrambling student, he will not ask for help. If the tutor offers help, the scrambler usually declines it, but if he does respond, it is something like, "I have to do [test] and I don't know how to get started." The tutor usually asks him general curriculum questions (e.g., "What have you studied so far?" or "What kind of problems are you working on right now?"), and these questions appear to overwhelm or frustrate the scrambler. He thanks the tutor after a short interaction and then leaves the lab or goes back to scrambling.

The scrambling student is generally in a catch-up situation, trying to do a semester or unit's worth of learning in an afternoon. He seems aware the lab exists as a resource, as he comes prior to tests, but it is unclear what he hopes to gain, as he does not request help or ask questions. It is unclear whether he does not know how to use the resource productively, is embarrassed to ask for help, or is aware that the task at hand is insurmountable. Regardless, the scrambling student's behavior can be distracting to other students in the lab, and his experience is not conducive to learning.

Statue

The statue appears in the lab primarily at the end of the semester or before major tests. He spreads appropriate learning tools and belongings (e.g., notebook, calculator, pencil, eraser) in front of himself. After deliberately setting up the footprint, he sits statue-esque with pencil poised above the paper, making very few movements and often not moving his pencil or head position for several minutes at a time.

The statue maintains the posture of work, but the majority of lab time is spent staring at the textbook or paper. He may copy a problem from the textbook but does not work it; he appears to be paralyzed or petrified by the problem, rather than thinking about it. The statue stares at the pages of his open book or flips through them rhythmically but does not read them.

The statue does not generally ask for help. If the tutor walks by, he may subtly watch her in what appears to be an attempt to get eye contact but will rarely raise a hand. Thus help-seeking is often overlooked. The tutors rarely ask the statue if he needs help, likely because he appears to be intently working or thinking. If the tutor initiates an interaction (this is rare) the statue sometimes declines help, or he may ask a question about how to get started on the problem he has been staring at. In an interaction involving little verbal feedback from the statue, tutors usually show him how to work a similar problem, explaining concepts and processes. The statue listens patiently, and may nod to signify understanding, but does not engage in the exchange with substantive dialogue that affirms understanding. When the tutor leaves, the statue usually tries to take the first step as it was just demonstrated. However, he appears to get stuck and continues to stare at the problem in statue form. The statue's time in the lab does not appear to be functional or productive.

Industrious

The industrious student usually comes into the lab alone; if he meets with another student, interactions are task-oriented. He has a serious affect, and sits with his back to the common spaces in the lab, facing a wall or corner. He does not look up when people pass by and does not appear to be distracted by other noises or interactions. The industrious student uses other tools while in the lab; he frequently consults computer resources or supplemental texts from the bookshelf. He may occupy a large footprint, but belongings and notebook are neatly organized: pencils in pouch, paper in order, calculator in a special case.

The industrious student writes a lot and spends most of his time in the lab working through problems. He plows ahead with his work regardless of tutor availability. When he encounters a difficult problem, he sits back and studies it. He aspires to get the answer on his own and will retry a problem a few times or consult other resources (textbook or Internet) to try to work through the problem independently. He checks his answers in the back of the textbook, and he nods or smiles when they match or studies and reattempts the problem when they do not.

The industrious student only asks for help on specific problems after he has worked them and consulted other resources. Help-seeking is subtle but direct. He may raise his hand or make eye contact with the tutors, but he waits until tutors are available. If a tutor does not notice the industrious student or is occupied in another tutoring interaction, the industrious student will swallow his question and continue working until the tutor is available.

Advice questions…turn the tutoring session into an advising one.

In tutoring interactions, the industrious student asks for procedural help, and the questions are process-oriented and focused on understanding. As the tutor explains, he may ask for clarification (e.g., "Stop. Wait. Tell me how you got that."), or he may stop her to try it himself (e.g., "Okay, let me try it."). During the tutoring interaction the industrious student is engaged and shares joint attention with the tutor as they work the problem together. Tutoring interactions are productive but short and not elaborated.

The industrious student seems to use the lab primarily as an independent study space. Most of the time, he works alone and independently consults other resources; industrious students frequently visit the lab and have no interactions with tutors whatsoever. However, they are in the lab with attention to getting work done and their questions and processes indicate a focus on understanding and learning rather than completing a homework assignment.

Social

The social student sits with other students in the lab and engages in dialogue or exchange. He may work on homework in a "study group" fashion, and his presence in the lab is characterized by loud conversations and laughter. The social student seeks to engage in interactions with peers or tutors. He frequently listens when tutors explain concepts to other students, even if he is not a part of the tutoring interaction; he cranes his neck or turns in his chair to see and hear what the tutor is doing with other students. The social student engages in conversation with other students, which may be well-received or regarded as an annoyance. Students sitting with or near the social student may initiate a tutoring interaction or question for the purpose of disentangling themselves from him.

The social student spends little time working independently. He is almost always engaged in conversation or social exchange, which may or may not be related to math or school, and he approaches help-seeking as a social interaction. He begins exchanges with pleasantries and frequently asks the tutor questions about herself and her math courses as a precursor to discussing his own class or questions. Much of his time in the lab is spent addressing nonmath concepts.

Many of the social students' actions and compliments serve to stroke tutors' egos. Some tutors enjoy this attention, and they are more responsive to the social student after he has developed a rapport. Other tutors seem to perceive these questions as feigned pleasantries or distractions and consistently steer the conversation back to math. Still, it seems that the social student had learned that developing rapport with tutors will pay dividends in increased attention, more detailed help, and more elaborated exchanges.

Though the social student asks few questions about math, he does ask questions pertinent to college transition and success. He requests "college knowledge" (Conley, 2008) and asks advice questions around registration, courses, and college processes. Questions about how or why to drop a class, what math teachers are "the best," what campus services are worth using, and which computer labs are less crowded during finals week turn the tutoring session into an advising one. The tutors may be regarded as an underground source, giving information that would not be provided in a formal advising interaction, or the social student may be more comfortable asking a peer for personal, rather than diplomatic, advice. Additionally, peer tutors are readily available for drop-in or ad-hoc conversations without the formalities of a scheduled appointment, and this just-in-time information may be students' preferred delivery method.

Discussion and Recommendations for Practice

Though the study identified and classified tutor-student interactions that were productive, unproductive, or overlooked, the real opportunities for engaged learning come from the interpretations of these behaviors. Better understanding of these categories creates opportunities for students, tutors,

Table 2

Recommendations for Serving Student and Institutional Objectives

	Tutors	Lab managers & Administrators
Dependent	• Learn and engage strategies for disentangling from unproductive interactions • Offer explanation at student's level of understanding • Prioritize academic integrity over customer service	• Observe lab to separate identify tutor styles and techniques • Support tutors in upholding academic integrity
Scrambling	• Encourage students to communicate with faculty • Engage students in conversation about needs and progress • Refer to other campus services	• Provide training around campus services and referrals • Communicate limits of tutoring role to faculty and student service providers
Statue	• Observe students' progress and movements over time in the lab • Engage in conversation to create rapport and facilitate comfor	• Provide training about math anxiety • Create a comfortable math lab environment to mitigate math anxiety
Industrious	• Engage in longer, more elaborated discussions • Use follow-up questions that push the engaged student to higher learning objectives	• Prioritize student learning over customer service ethos • Encourage more constructivist and elaborated tutoring methods
Social	• Understand peer advising role and limitations of peer advisor • Do not resist participation in these types of interactions • Refer to other campus services	• Define the peer advising role is and the lab's responsibility to this objective • Provide training appropriate to the lab's role

Note. All student types provide an opportunity for faculty, tutors, and lab managers to work collaboratively to better serve student needs. As tutors should be trained to refer students to their faculty members, faculty should conversely communicate honestly with students who are very far behind in their coursework or foundational skills.

and lab managers. Table 2 provides an overview of these recommendations.

Dependent

Dependent students' behaviors seem to be primarily motivated by a lack of foundational skills that would allow them to work independently, and their behaviors serve as compensatory strategies. Chng, Yew, and Schmidt (2015) note that low-performing students rely heavily on tutors for guidance and motivation, and this holds true in the math lab. Dependent students seem afraid of demonstrating that they cannot do the work, so they do not try to work independently. Although this may be effective for the student's immediate need of getting an assignment done, the long-term impacts are deleterious to learning. Aside from the possibility that the student will advance without understanding fundamental concepts, reliance on tutors and external help sources to complete work may only reinforce the student's lack of self-efficacy (see Ryan et al., 1998; Ryan & Pintrich, 1997).

The dependent student's behavior presents another serious consideration beyond teaching and learning goals: one of academic integrity. As he wears the tutor down and she does more and more work for him, the interaction comes dangerously close to malfeasance, wherein a well-intentioned or frustrated tutor crosses a line and completes work for a student, instead of helping him to learn the concept. This perception is not unique to our math lab; Perin (2004) noted a strong perception that tutors help too much and that the work coming out of the lab is done by the tutors, rather than the students themselves.

Recommended Strategies: Dependent

Teachers report that they spend more time and find their interactions more challenging with students who are not appropriate help-seekers (Arbreton, 1993), and this seems to also characterize the tutors' experience with dependent students. As the dependent student wears down the tutor by monopolizing her time, the tutor shifts to increased explanation and less dialogic exchange, a phenomenon also observed in large classes where students compete for teacher attention (Hornsby & Osman, 2014). Aside from increasingly ineffective tutoring practices – even from tutors who had been trained to use questioning and constructivist methods – such interactions monopolize tutor time and distract them from other students in the lab. Tutors need to learn strategies for disentangling from these interactions and for avoiding over-helping, delivering explanation appropriate to the students' skill level rather than the complexity of the homework assignment.

Lab managers should be aware that this tendency seems to be exacerbated by a lack of tutor agency that characterizes the peer tutoring relationship. The greatest need may be support for tutors who do resist pressure to over-help dependent students. Though these tutors model academic integrity, in so doing they receive complaints labeling them "rude" or "unhelpful." Though respect is a priority for the lab, strategies for actualizing learning objectives do not always align with the customer service ethos that position the student as "always right" or seek to deliver the service that students want regardless of its pedagogical efficacy. The challenge and responsibility for tutoring center administrators is to support tutors who set boundaries and maintain integrity, even and perhaps especially when that tutor is unpopular with some student learners. Administrators will need to observe tutor-student interactions to distinguish the cause of student complaints and whether they warrant tutor counseling for unprofessionalism or accolades for resisting social pressure to over-help. Curtailing unproductive exchanges may also promote more effective interactions with other students and promote a more academic tone for the lab.

Scrambling

The scrambling student presents a different but equally complex challenge. The difference between the scrambling student and the dependent student, who is effectively in the same academic circumstance, is that, despite his behaviors that draw attention to himself, the scrambling student typically either declines help or receives it in short, nonelaborated interactions. From a time management perspective, the scrambling student is unproblematic. It seems that this student, in the way that he declines help, knows that the learning objectives are insurmountable in the time available. However, from a pedagogical perspective, the scattered student does not have a productive learning experience in the lab. The students' seemingly agitated and frustrated state of panic inhibits learning at any level of complexity (see Cain et al., 2009).

Cramming is common practice on campus (Hartwig & Dunlosky, 2012); though it has been demonstrated as unproductive for learning, students perceive that it is a very effective strategy (Kornell, 2009; Moore, 2004). Low-performing students are more likely to study around impeding deadlines and are the least likely to regularly schedule study time (Hartwig & Dunlosky, 2012). Though time management skills are highly emphasized for new college students, by the time students exhibit scrambling behavior in the math lab, it is too late in the semester to catch up on learning.

Recommended Strategies: Scrambling

It is not effective for students to cram material when they are far behind in a class, and it is inappropriate to task tutors with ameliorating this. For the tutors, it seems that the most effective and helpful service would be to encourage scrambling students to visit instructors during office hours to discuss their course progress. Though tutors should not give unsolicited advice about withdrawal, they can direct students to instructors, who have knowledge, authority, and context to make such recommendations. When tutors notice a scrambling student, it may be most productive to engage him in dialogue around his campus experience (e.g., "How are you?" "How have things been going for you this semester?") rather than diving into math concepts right away. This may encourage scrambling students to identify and communicate their greater needs, for which tutors could make appropriate referrals.

From a management prospective, supervisors should support tutors in referring students to faculty or campus services when their needs exceed the capacity or scope of the math lab. The scrambling student also presents an opportunity to increase collaboration and communication between faculty, tutors, and math lab administrators. Faculty who encounter scramblers in their classrooms should invite them to office hours and have honest dialogue before suggesting that they catch up in the math lab. Helping faculty to understand and communicate the dynamic, opportunities, and expectations of the math lab to students will facilitate more productive interactions.

Statue

Despite having outwardly opposite behavioral displays, the statue's time in the lab is functionally similar to the scrambling student. They are both typically far behind in their classes and only show up in the lab when it is too late, do not seek help, and fail to complete any work. However, although the scrambling student's behavior seems to be panicked or agitated with course circumstances, the statue's behavior is consistent with math anxiety wherein the disruption of working memory renders him unable to convert knowledge and skills into performance of required tasks. Instead, cognitive function is disrupted by negative thoughts before he can complete a step of the problem at hand (Ashcroft & Kirk, 2001). Math anxiety causes students to avoid mathematics or perform poorly on these tasks (Ashcroft & Kirk, 2001; Hembree, 1990); developmental math courses tend to enroll a greater proportion of math anxious students, thus the lab will likely encounter many statues.

The statue suggests an opportunity to create trainings on math anxiety.

Recommended Strategies: Statue

A simple but important first step for tutors is to identify the statue. Unlike the dependent or scrambling student, the statues are frequently unnoticed. Besides a posture that is almost identical to that of a studying student, the statue is difficult to notice in an open lab, particularly when multiple tutors are on shift. When tutors notice a student who appears to be deeply engrossed in study, they should take note of the problem he is working on and what is written on his paper. If the student has not moved from that place in 10 minutes, he is likely a statue, and tutors should seek to engage him in friendly, nonthreatening conversation. Noting that constructed perceptions about math ability affect tenacity and success, Silva and White (2013) recommend classroom strategies that focus on personal and psychological attributes that promote productive persistence. There is an opportunity to do these in the tutoring lab as well.

From a lab management perspective, the statue suggests an opportunity to create trainings on math anxiety and construct a lab environment that helps to ameliorate it. Because it is different from the classroom, conceptualizing the math lab as a welcoming and social space may be an opportune place to begin to deconstruct anxieties through interaction and dialogue. This is a role and opportunity beyond discrete tutoring interactions, but one that could facilitate meaningful partnerships with math faculty.

Industrious

The industrious student in many ways models the student ideal – he is organized and task-oriented, and models the strategic-adaptive help-seeking behaviors described by Karabenick (2003). He consults other resources in his desire to understand concepts, and his interactions with tutors model a focus on understanding and process, rather than product. The industrious student usually looks to other resources before asking the tutor for help, and his use of self-explanation and self-monitoring facilitates deeper understanding (Chi, Bassok, Lewis, Reimann, & Glaser, 1989). Though this independent approach is an effective learning strategy, when the industrious student does request assistance his help-seeking behaviors are subtle and–especially when the lab is busy with more visibly needy students–he goes unnoticed by tutors.

Recommended Strategies: Industrious

To better serve industrious students, tutors should be trained to be more attentive to subtle help-seeking behaviors. Additionally, because the industrious student approaches the tutoring interaction with a learning goal, this is an opportunity to engage in longer and more elaborated discussions, using follow-up questions that scaffold him to higher learning (Bruner, 1983). Tutors should engage deeper questioning that requires integrating knowledge and attempting problems at the next level of challenge (Roscoe & Chi, 2007) to facilitate more meaningful exchanges.

From a management perspective, the industrious student represents a different intersection of need and priority. As the student most likely to meet his learning needs independently, he is the least needy in the lab. On the other hand, he also appears to actualize the greatest benefit from tutoring effort expended. Prioritizing productive student learning in the mantra of the lab may support the tutors in engaging in deeper and more elaborated interactions with industrious students. Increasing such interactions is not only a net gain for productivity and learning but a visible model for other students who are developing these appropriate learning and self-management strategies.

Social

The social student highlights a function and service provided in the tutoring lab of which we were not explicitly aware. There is much literature problematizing high dropout and failure rates for developmental education and first-generation students (see Crosta, 2013; Gerlaugh et al., 2007; Li et al., 2013; Longwell-Grice, 2003), and academic support is generally identified as the antidote (Crosta, 2013). Concomitantly, other scholars note social and cultural challenges that characterize the transition experience (Conley, 2008; Karp & Bork, 2012) and advocate for a social support system that includes student-to-student connections (Oldfield, 2007). It seems that some students have found this support via tutors.

Recommended Strategies: Social

As tutors are–perhaps unwittingly–already serving in this capacity, reflection is an opportunity. First, tutors should be aware of this role and cognizant of its service to students and the institution. Though not math-oriented, tutors should recognize that these interactions are also productive, and they do not necessarily need to disentangle from these conversations. Peer advisors perceive that they are less effective in situations outside of their assigned work or training (Martinez, 2013), thus they will need training to fulfill this role effectively. Additionally, though they are peers, tutors hold positions of relative authority, and should receive training around the limits of their authority and be knowledgeable about when and how to refer to other campus professionals.

Formal peer advising is becoming increasingly popular on college campuses, particularly for general, institution-level knowledge (NACADA, 2011). If tutors are going to serve as *de facto* peer advisors, the lab will need to clarify its role in this enterprise and set appropriate boundaries. For managers with taxed staff and budgets, this may seem like an added responsibility on programs that are already over-extended. However, our observations suggest that tutors are already delivering this service. As such, whether or not it is an explicit responsibility of the lab, tutors will need appropriate training so they can refer students to other campus services when needs exceed their knowledge or authority. This will likely require input to tutor trainings from student services personnel who are not often engaged in the delivery of academic support services. This presents an opportunity for partnership and dialogue with other campus service providers who share goals for student success.

Limitations

Though the data collection and analysis were done collaboratively and with integrity, this study presents some significant limitations. First, it was conducted in a single lab. Though its features (drop-in tutoring model, use of peer tutors, and CRLA training program) are characteristic of many math labs, more research is needed to determine whether these categories would be applicable in other institutional contexts. Though we reached saturation with our data collection, we observed most students in only one sitting. Whether an individual student's behavior varies with lab conditions or different tutoring styles was not determined. There is an opportunity to explore the frequency of student patterns of behavior, adding quantitative data including the relative proportion of student behaviors and which characteristics correlate with these behaviors.

Another limitation of our study was the lack of student input or narrative around their tutoring experiences. Using an etic approach, we recorded all behaviors, but as researchers we emphasized and described what we regarded as important. We do not know the students' learning goals or objectives, how they would explain their behavior, and whether it complemented their independent studies; the lack of a complementary emic perspectives is a limitation (Hanh, Jorgenson, & Leeds-Hurwitz, 2011). Additionally, how student behavior correlated with learning outcomes or course performance was not explored in this analysis.

Because we are members of the campus community where we conducted these observations, and in some cases held supervisory roles over the tutors observed, it is possible that our presence in the lab impacted or changed natural patterns of behavior, or that our connections to the lab influenced our perceptions. Though we feel that our presence was generally unobtrusive and that the collaborative analysis helped mitigate bias, this must be considered as a limitation.

> *Tutors will need appropriate training so they can refer students to other campus services.*

Conclusion

Neither tutoring nor the management of tutoring programs are easy jobs. We perform these tasks ourselves, and we appreciate and value their constraints, demands, and complexities. As such, this article is not intended to criticize tutoring centers but rather to underscore the opportunities inherent within them–in both an academic and student services context–and to implore administrators to resource and research them further.

Our focused observations found that tutors and administrators are unaware of some fundamental happenings in the lab, even though they participate in constructing them. As students spend more time working independently than being directly tutored, the physical and social spaces of the lab merit attention. Our observations identified an opportunity for tutoring to foster engagement and collaboration beyond specific mathematical concepts. For example, we observed that students do not generally regard one another as resources: They will wait to ask a tutor a question but will not seek help from peers sitting next to them. In this vein, tutors also individualize their interactions, working with students one-on-one, even when multiple students in the lab are seeking assistance around the same concept. Attention to social comfort and connection in the lab may facilitate more meaningful student-student interactions and more productive tutoring (Good et al., 1987; Ryan et al., 1998).

Broadly, the literature on tutoring centers focuses on tutoring interactions and communications, but there is opportunity to examine what else happens in the lab and how students make use of independent study time. This study is a step in that direction as it explores the concept of academic help-seeking and wait time in this context. The preliminary findings have implications for lab management and for student success; they also present opportunities for future research, particularly as colleges implement more developmental education models that require additional tutoring support, such as corequisite or accelerated developmental education courses (Center for Community College Student Engagement, 2016).

On a personal note, we found the research to be a rewarding and enlightening collaborative process. In our busy and over-extended schedules, we rarely stop to just observe students. Nor do we find many opportunities to engage in meaningful dialogue with our colleagues around student outcomes. Beyond our contribution to the literature, this project was an opportunity for us to connect with our work, our students, and with one another. We hope to continue this momentum and embrace this opportunity to participate in ongoing dialogue.

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