

Meeting the Needs of Gifted and Talented Students: Case Study of a Virtual Learning Lab in a Rural Middle School

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Abstract

Researchers used case study methods to investigate a virtual learning lab (VLL) in a rural school district that was created in 2011 as a way to better meet the unique needs of exceptional students who are considered gifted. Data were collected through focus groups, classroom observations, interviews, and reviewing relevant documents. Topics include an in-depth explication of the learning lab, lessons learned and suggestions by teachers and administrators, and benefits for improved teaching and learning. Findings are that VLL programming, specifically online instruction that takes place in brick-and-mortar public schools, can be an effective means for providing accelerated coursework to exceptional middle school students who are gifted. Benefits include cost-effectiveness, parent and student satisfaction, allowing for individualized work pace in talent area, and others.

Keywords

acceleration, gifted, qualitative, technology, talent development, motivation, achievement

According to the 2012 Keeping Pace study of online and blended learning across the United States, blended schools and blended programs are quickly growing segments of online delivery of content and instruction (Watson, Murin, Vashaw, Gemin, & Rapp, 2012). The report estimates that in 2012, two thirds of school districts offered at least

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one online or blended program, and a large majority of programs have relatively few students and rely on external course providers. Districts offer these options with the intention of expanding access to courses that might not otherwise be available for students, improving quality of instruction, and reducing costs. However, little research has been documented on how well or in what ways these programs meet the unique needs of gifted and talented students.

This case study provides an intimate look at blended learning with the intention to describe an emerging model. First, that a student must be in a supervised brick-and-mortar location away from home at least part of the time; and second, that the person who supervises is an adult who is physically present. Researchers use case study methods (Creswell, 2007; Stake, 1995; Stufflebeam, 2001) to answer questions focused primarily on the quality of learning and teaching, and the achievements of learners. The purpose of the case study was to provide stakeholders with an authoritative, in-depth well-documented explication of a virtual learning lab (VLL) school located in a rural region in the Southeastern United States and information about its benefits and challenges. It provides useful information for others who might want to implement a VLL, which infuses a place-based brick-and-mortar style classroom with online instruction. It also helps document how this type of blended learning addresses all five of the lessons learned from Rogers's (2007) synthesis of what the research says about gifted educational provisions.

Literature Review

Many schools and states are turning to online learning to replace or supplement teaching in brick-and-mortar classrooms. A recent report by the National Center for Education Statistics (Queen & Lewis, 2011) revealed that for 2009-2010, 55% of public school districts reported having students enrolled in distance education courses. This is up from about 37% in 2004-2005. Among those districts with enrollment in distance education, 96% reported having distance education at the high school level, with fewer having it at the middle (19%) and elementary (6%) school levels. The report also revealed that while many offer these courses for course credit recovery (57%), even more do so to provide courses not otherwise available at the school (64%).

Blended Learning and the Forces That Drive It

Governor Rick Scott signed into law the Digital Learning Now Act (2011) that requires Florida school districts to establish virtual learning options, and authorizes customized and accelerated courses to be delivered in traditional school settings by personnel providing direct instruction through a blended environment. The law also requires all incoming ninth-grade students to complete an online course as part of the 24 credits required for graduation. Such legislative demands in a time of budget deficits and infrastructure issues have increased the adoption of virtual and blended learning as a means to satisfy school choice options (Rauh, 2011). In addition, there has been continued growth in the proportion of postsecondary students learning online, with the

number of students taking at least one online course at an all-time high of 33.5% in 2012 (Allen & Seaman, 2014).

Staker (2011) emphasized two clauses in her definition of blended learning; first, that a student must be in a supervised brick-and-mortar location away from home at least part of the time; and second, that the person who supervises is an adult who is physically present. The most traditional location for this is in a school building, but it could be in another type of facility such as a storefront learning center with a computer lab. There are several models for blended learning, and the adult, or teacher, who is supervising can play different roles depending on which one is used. For example, Staker and Horn (2012) used examples of more than 80 programs in the K-12 sector to identify four broadly defined blended-learning models that have emerged. They included the Flex, A La Carte (formerly Self-Blend), Enriched-Virtual, and Rotation models. The VLL we focus on in this study uses the lab rotation variant of the Rotation model, where students rotate on a fixed schedule between online learning and other modalities. In this case, students spend one period a day in the VLL and the rest of the day rotating to more traditional face-to-face classrooms.

An increasing number of cases of blended-learning options are emerging in small, rural communities (Means, Bakia, & Murphy, 2014). VLL can be a cost beneficial way to provide access to courses in areas lacking either the critical mass of students needed to justify a teacher's salary or the lack of availability of teachers for certain subjects. Smaller class sizes or finding the right teacher may not be feasible, economically, or otherwise. An example of this is the lack of foreign language teachers when students must meet a foreign language requirement for college entrance (Weil, 2009).

This study examines one such VLL, where all of the courses that are being offered allow students to accelerate. Acceleration is a common strategy for differentiating instruction for gifted students, which can be done in different ways. The term may refer to service delivery such as grade skipping, early entry, and credit by examination or it may denote curriculum delivery at a faster pace in one or more subject areas. Some of the benefits of acceleration include higher academic achievement, positive self-esteem, and healthy social adjustment (Kulik & Kulik, 1984, 1992; Vialle, Ashton, & Carlton, 2001). VanTassel-Baska (1989) described additional advantages of acceleration such as stronger motivation and confidence, early completion of professional training, and lower education costs. The acceleration process can allow some students to move at a faster pace than a standard sequence, and in some cases it can shorten the length of time required for a learner to complete schooling. Vialle et al., (2001) emphasized that schools should have a set procedure and criteria for identifying students for accelerated programming. The form of acceleration that is chosen should reflect the specific educational needs of the individual student.

Blended Learning in K-12 Environments

In one of the first studies to collect data on and compare fully online and blended learning in K-12 schools, it was found that while fully online courses have higher student enrollment than blended courses, blended models can have greater potential than fully online models (Means, Toyama, Murphy, Bakia, & Jones, 2009).

This finding was based on results from a national survey of school district administrators, published by the Sloan Consortium (Picciano, Seaman, & Sloan, 2009). Piccanino, et al. (2009) found that blended courses may be a better option for school districts that have concerns about quality, student readiness, and teacher readiness to teach online. With blended courses, if the online course was not meeting a student's needs, there would be a teacher readily available there to help them face to face. They also pointed to another study, commissioned by the North American Council for Online Learning, that states that the blended approach merges the best elements of online learning with the benefits of the face-to-face classroom, and that "it is likely to emerge as the predominant model for the future—and to become far more common than either one alone" (Watson, 2008, p. 3).

While online and blended programs are becoming more popular over time, there has been little empirical research regarding the role and effectiveness of this type of program for K-12 online learners (Hasler-Waters & Leong, 2011; Means et al., 2009) or how to implement and tailor these programs for gifted students within a school setting (Wallace, 2009). This is particularly true when attempting to measure any differences between blended, online, or face-to-face teaching and learning.

Means et al. (2009) conducted a meta-analysis of the literature for the U.S. Department of Education to provide research-based guidance on implementation of online learning for K-12 education and teacher preparation. Their initial search of the literature published between 1996 and 2006 found *no* studies contrasting K-12 online learning with face-to-face instruction that met methodological quality criteria. The second literature search expanded the time frame through July 2008 identifying more than a thousand empirical studies, and found only five studies meeting their criteria. Key findings from the meta-analysis included that students in online conditions performed modestly better, on average, than those learning the same material through traditional face-to-face instruction; and that instruction combining online and face-to-face elements had a larger advantage relative to purely face-to-face instruction or purely online instruction. The synthesis also revealed that effects were larger for studies in which the online instruction was collaborative or instructor-directed than in those studies where online learners worked independently. However, they mentioned caveats. For example, despite the strong support for blended learning, online learning was not found to be superior as a medium, and observed learning advantages were likely produced from differences in the combination of treatment conditions (time spent, curriculum, and pedagogy). Although the report held findings and implications for K-12, caution should be used in generalizing as the results were derived mostly from other settings, for example, career technology, medical training, higher education, and teacher preparation, and were not specific to gifted students.

Even more recently, in 2012, Halverson, Graham, Spring, and Drysdale once again confirmed the lack of blended-learning research in K-12 environments in their review of the most frequently cited research on the topic. There were two broad reasons for this shortage. First, researchers and practitioners had varied definitions and terminologies of e-learning and blended learning (Lowenthal & Wilson, 2010; Moore, Dickson-Deane, & Galyen, 2011); and second, there was a shortage of research conducted at the K-12 level.

Online or Blended Programming and Gifted Education

Rogers's (2007) synthesis of the research on educational practices about educating the gifted and talented which covered 150 years discusses five lessons to consider for how services should be implemented. These include that gifted and talented learners need daily challenge in their specific area of talent, regular opportunities to be unique and work independently in their areas of passion and talent, various forms of subject and grade-based acceleration, opportunities to socialize and learn with like-ability peers, and differentiated instruction in pace, amount of review and practice, and organization of content presentation.

Thomson (2010) examined perceptions and experiences of gifted students and their teachers to better understand how online learning environments can meet the needs of gifted learners and found that the online format was conducive to a more individualized and differentiated learning experience than face-to-face in a regular classroom: "Students are able to work at a pace consistent with their rate of learning, have more time to reflect, to feel more in control of the learning process, and to engage in more self-directed and independent learning" (p. 663). She also confirmed findings by other researchers (Olszewski-Kubilius & Lee, 2004; Ravaglia, Suppes, Stillinger, & Alper, 1995) indicating online learning can expand access to advanced courses to students whose local schools cannot offer such a wide variety of options or do not have the resources for extended gifted programming, and for students who cannot take these classes because of scheduling conflicts.

While we know what works for gifted education in more traditional settings, the lack of research in K-12 online learning means that even less is known about the efficacy of online learning for the gifted and talented. Our search identified a few studies that were relevant to the role and effectiveness of blended learning in a gifted classroom, but none that were empirically based. For example, Olszewski-Kubilius and Lee (2004) performed a descriptive study, investigating gifted adolescents who took online Advanced Placement (AP) or honors-level courses for high school credit from home for part of the day. This research revealed that students' major reasons for enrollment included interest in subject areas, desire for enrichment and acceleration for themselves, and to take courses not otherwise offered at their home school. Study participants were satisfied with the quality of communications with instructors or classmates. But for some, a lack of contact with their teacher was a source of dissatisfaction. Other findings included that challenge and enjoyment were the most important and beneficial aspects of the experience; and that most students wanted to use computer technologies to have easier access to teachers, other students, and course content, but still wanted traditional textbooks and written course materials.

Because there were so few studies, we searched for other blended-learning programs that had been documented for gifted and talented. Clayton Christensen Institute's (2013) Blended-Learning Universe database contains 53 profiles and brief case studies of organizations that are beginning to blend online learning with supervised brick-and-mortar settings. From the self-reported information, we found only one school in the database whose designated focus was serving gifted and talented adolescents:

STAR Prep Academy (Grades 6-12), which was a private school in Culver City, California, serving 40 students. Adams and Cross (1999) identified another program, which is a virtual Governor's School for gifted and talented students of far southwest Virginia, which used a blended-learning program to provide challenging courses that were not otherwise available to the targeted students in their regular school program.

According to Brulles and Winebrenner (2012), due to budget constraints, programs for advanced learners can be the first to be eliminated, posing an additional challenge to research and understanding in this area. Furthermore, current support for intervention research, and the data that are collected on those identified as gifted is "very limited, and what is collected is rarely reported" (Plucker & Callahan, 2014, p. 400).

In summary, this literature, as well as other studies, suggests that while blended-learning programs are a growing segment of online learning in K-12 schools that can open the doors to a wider variety of options and benefits for extending gifted programming, very little has been documented about the role and effectiveness of blended learning in a gifted classroom, and none of this literature is empirically based.

Purpose

The purpose of this study is to better understand participants' perspectives and describe how a VLL, specifically online instruction that takes place in brick-and-mortar public schools, can be used to provide accelerated coursework to exceptional middle school students who are gifted.

Method

The premise of this study is that VLL programming can be a way to provide acceleration coursework to these students in their area of talent, while giving them options to work either with or alongside their same age gifted peers and with differentiated instruction and pace. A case study approach was chosen as an appropriate evaluation tool because it allowed us to understand the types of interactions between the teachers and learners in a blended-learning setting, without having to generalize beyond it (Stake, 1998). Investigators closely examined the VLL on multiple levels and holistically within geographic, cultural, organizational, and historical contexts to come up with a research-based case description and case-based themes (Stufflebeam, 2001). The study had several orienting questions, including the following: What is the historical progress of the VLL and what was the need that drove its development? What are the characteristics of the VLL environment and how does it operate? What benefits are perceived for gifted learners? How does the lab support students' development of 21st-century skills? What are the lab's most important unresolved issues and lessons learned?

Setting

The case described in this report exemplifies a Florida Virtual School (FLVS) VLL model, which allows public school students to learn in a blended-learning environment. FLVS is among the nation's largest statewide, accredited, Internet-based public

schools. The school is massive, and currently has more than 1,000 teachers, 148,000 students, and 120 different virtual courses to choose from. Courses are free for students who are state residents and tuition based for those outside the state. School districts use VLL to ease class-size limits, help students fulfill graduation requirements, and improve academic results (Staker, 2011). As of the 2012-2013 school year, there were more than 32,000 students enrolled in 317 FLVS VLL in Florida (FLVS, 2013), which offer courses in a variety of ways, all using a computer lab or other classroom with on-site lab facilitators. Eighteen (6%) of these units serve students in rural areas, like the one in this study. Most serve secondary students and have an average of 25 students per lab. There are only two VLL in Florida that were created exclusively for providing special education services, one of which was the focus of this study: *a VLL designed exclusively for acceleration with middle school students who are gifted*.

The VLL for this study is at a middle school located in a rural region in Florida, which was created as a way to better meet the unique needs of exceptional students who are considered gifted. The district encompasses four elementary schools, one middle school, two high schools, and one combination school. At the time of the study, the middle school had 1,048 students enrolled, and enrollment in the VLL for 2011-2012 and 2012-2013 was steady at 45 gifted students per year. Florida legislation, *Section 1003.01, F.S.*, has identified gifted learners as part of the exceptional student education populations since 1968 (Florida Legislature, Office of Program Policy Analysis and Government Accountability, 1996). The school had more than two thirds of its students qualifying for free-and-reduced lunch and a 34% minority rate. By state standards, the school received a school grade of C (Florida Department of Education, 2015). Fifty-eight percent of the students at the school met satisfactory level of success for reading, 55% for math, 73% for writing, and 44% for science (Florida Department of Education, 2012). Of the 45 students who were enrolled in the VLL, 100% of the enrolled eighth graders, 70% of the seventh graders, and 70% of the sixth graders had been placed on the gifted track for more than 4 years. Eleven percent of the students were classified as having dual exceptionalities, mostly gifted and speech impaired.

Historical Progress and Need

Students' gifted services for K-12 before 2009-2010 in this school district consisted mainly of consultative and pull-out services with the district's one gifted specialist. The specialist went from school to school and worked with teachers and students on enrichment activities. According to the District Director of Student Services/School Psychologist, the amount of time that students were able to participate in gifted programming was minimal at that point and many felt this model was too distracting. As a result, in 2009-2010, the district began offering other options. At the middle school, this included gifted students enrolling in a nonacademic elective class for one period a day, in addition to pull-out services. Parents and students had mixed reviews. Parents felt that it was unfair for the students to have to give up the other more appealing electives that were available. Some students wanted to drop out and go back to the previous model and take band or another nonacademic course.

At that time, FLVS approached the school district and school to discuss the possibilities for using a VLL at the middle school as a way to better meet the unique needs of exceptional students who are gifted. According to the principal, FLVS was selected due to its good reputation for VLLs and because it offered challenging courses that could provide their students with the experience needed to be ready to take AP and dual enrollment courses in high school. This was appealing to students and parents as well, particularly because different course choices would become available. Not only was it beneficial that many different high school courses would be accessible but also multiple courses could be offered simultaneously to the same class. It was also attractive because VLL coursework could be substituted for an elective (nonacademic) class, and not interfere with students' schedules.

Logic of Operation and Productivity

Description of the VLL. The middle school VLL that was implemented represents the lab rotation variant of the Rotation model (Staker & Horn, 2012), where students rotate on a fixed schedule to the VLL one period a day, while moving through various other locations on the brick-and-mortar campus for their other classes. Although this type of model typically employs a paraprofessional as the brick-and-mortar facilitator, this one differed in that a certified gifted teacher was employed to supervise students. The lab resembled other classrooms in the school. School desks were lined up either in rows, or in small group arrangements depending on need; there was a teacher's desk, whiteboard, and plenty of windows and storage space. What distinguished this VLL from other classrooms was that attractive posters of goal setting activities for the online courses and student pace charts were displayed on the walls in the classroom. The classroom was equipped with two laptops carts and a small adjacent room visible through a window which had a telephone available for student(s) to communicate with their online instructor to ask questions, complete Discussion-Based Assessments (DBA), or participate in welcome calls.

Purpose of the VLL. The overarching goal for the VLL is to ensure that it gave the students enough academic support and challenge. Objectives include

- providing a highly effective certified teacher to facilitate the lab and provide support,
- offering a range of online courses that are best suited for students,
- providing tailored learning methods with student-centered options,
- providing opportunities for students to work at their own pace,
- providing opportunities to learn 21st-century skills, and
- meeting the needs of gifted and talented students.

Orientation and registration. Before the school year begins each year, gifted students and their parents/guardians are invited to attend an orientation meeting, facilitated by the school and FLVS, where they are provided with information about the lab, including lab

requirements, how it operates, and the different options for coursework. They are walked through the steps for making an account, and how to select one of the recommended courses. There is plenty of time for questions and discussion. If students sign up for a course, they begin coursework in the fall, when school starts. Meetings are also held for each child with their parents/guardians and the guidance counselor(s) to discuss the educational plan (EP) related to students' individual needs and the services being provided.

During their VLL experience, middle school students are enrolled in high school courses for credit. Regardless of what courses they choose, they are grouped in the VLL by their respective grade level. Participating students are enrolled in an elective course, *Advanced Academics: 6-8*. For this study, of the 63 courses offered at the high school level by FLVS, middle and high school administrators work collaboratively and chose courses that complement and strengthen the school's overall existing program. Students in the lab during this study enrolled in 11 different courses, sticking mainly to one area of interest or track:

- Science Track: Biology I and Forensic Science
- Foreign Language Track: Chinese I, Spanish I and II, Latin I
- Mathematics Track: Algebra I (for seventh grade), Geometry
- History Track: World History, U.S. History
- Other: Computing for College and Careers

Procedures and Data Analysis

Case study procedures relied primarily on steps supported by the literature and suggested by Creswell (2007), Stufflebeam (2001), and Stake (1995). Multiple sources of information were used for data collection, including all six of the sources identified by Yin (1994) and Stake (1995): documentation, archival records, interviews, direct observation, participant observation, and physical artifacts.

Data collection was performed over 3 months in 2012 during visits to the middle school, and beyond that for several months for follow-up interviews. This was enough interaction time among the relevant parties for the researchers to develop what we perceived as a valid understanding of the case. Researchers performed three site visits where they conducted direct and participant observations, interviews with the VLL teacher and school/district administrators, focus groups with VLL students, and reviewed data on student achievement, enrollment records, program descriptions, job descriptions, and reports. For each of these visits, at least two researchers took extensive field notes, using handwritten notes which were later converted into computer file, as well as taking care to distinguish what they observed, from both their expectations and their interpretations for what they observed. Some analysis of these notes occurred both independently and after discussion between the researchers while they were still in the field. Other sources included photographs, end of course survey results, and a logical analysis of how the VLL operates. Administrators, from both the middle school and from FLVS, who had been present both before the lab was created, and during its development and implementation, were engaged in helping to plan and

arrange access for conducting the study, and helping verify the entirety and completeness of the findings.

We (the researchers) made a strong effort to meet regularly and take steps to neither underestimate nor overestimate our effects and taking seriously our responsibility to describe and study the VLL. We recognized and discussed our perceptions that were shaped by our different experiences which we took into the field. For example, this included a parent of gifted children; a student who designated as gifted in K-12; post-secondary experts in instructional design, school psychology, and counselor education; a former middle school teacher; and online and face-to-face instructors. Reliability was increased through methods recommended by Patton (1999) to help verify and validate the analysis: (a) *Methods triangulation* was checked with consistency of findings generated from different methods, including interviews, observations, document analysis, and other sources; (b) *triangulation of sources* by looking for consistency of different sources of data within the same method; and (c) *investigator triangulation*, by using multiple analysts to review the findings.

Students assigned to the VLL completed a written assignment where they reflected back on the teaching and learning they had experienced in the lab. Reflection topics were provided, which focused on *time management*, *the level of involvement*, *comparing online learning versus face-to-face*, *21st-century skills*, *likes and dislikes about the experience*, and *whether they would recommend the model for other schools to follow*. About a week after the written assignment, students participated in a guided focus group where they had an opportunity to expand upon their written answers and interactively discuss their perceptions, opinions, and attitudes about the topics with the researchers and their peers. Three focus groups were conducted at the VLL during class time with the students. The focus groups included one for each of the three grade levels—sixth, seventh, and eighth. Each focus group was about an hour in length. All 24 VLL students who were present at the time were invited, and only one, who was catching up on school work, did not participate.

Research involved in-depth interviews (Stake, 1995) with school, district, and FLVS personnel to obtain detailed background on the middle school and the VLL, and to ascertain their perceptions about the lab's effectiveness and lessons learned. These ranged from 45 min to 1.5 hr in length and allowed for open-ended, discovery-oriented responses. Later, shorter follow-up interviews were conducted to obtain more information. At the middle school, this included three separate interviews with the gifted instructor, one with the school principal, and two with the assistant principal/curriculum coordinator. Two interviews were performed with the school district director of student services/school psychologist, who provided background about the gifted track, from elementary through high school, along with a district perspective. Three FLVS administrators, who were directly involved with the school's lab provided other important feedback. We also gathered information from a small group discussion with administrators from the middle school, the district, and FLVS, that lasted for about 1.5 hours. The study also used focus groups to provide a unique insight into the socially constructed perceptions of the group that could not be represented by participants' individual responses alone (Krueger & Casey, 2000).

Both the focus groups and the interviews were transcribed and analyzed manually using open and axial coding to identify major themes (Strauss & Corbin, 1998). Initial jottings and notes about possible themes and open codes were developed independently by two researchers, and then a final coding scheme was developed through their discussion (Morse, Barrett, Mayan, Olson, & Spiers, 2002; Saldaña, 2009). Disagreements about the coding were discussed using sensitivity, flexibility, and insight to reach consensus (Morse et al., 2002). Open-ended responses from students' written assignments were used to explore the respondents' own perceptions. These were analyzed in the same method as the transcripts. Many of the codes for these sources were arranged into themes and some of the representative quotes for the themes are provided. To help illustrate the method, there were seven axial codes (main categories/themes) for *Developing 21st-Century Skills*, which we ended up with to help summarize findings. Each of these had multiple open codes (labels) that were then used to further categorize. For example, for *communication skills* the researchers agreed on nine open codes that came up multiple times: *making phone calls, texting about the course, DBAs, using or responding to email, indicating more or less verbal, discussions, foreign language use, asking for or getting help, and other soft skills related.*

Findings

Benefits of the VLL

Potential benefits of the VLL for both the students and the school were investigated. The ones supported through this research are summarized.

Successful completion of accelerated coursework. A review of records revealed that all 45 students (100%) enrolled in the VLL in 2011-2012 successfully completed their coursework. Almost all made As and Bs and according to the assistant principal/curriculum coordinator students did better than what might be expected. "There was only one or two C's out of all of these [middle school] students that participated in the high school credit which says to me that it's successful and they are able to academically succeed in those courses" (personal interview, January 7, 2013).

Extending course offerings: Efficiency from distributed staffing. Having multiple courses offered in one room, because of distributed FLVS staffing, provides students with beneficial choices that would otherwise be inaccessible. This is because of higher costs and state restrictions on class size and teacher-student ratios, often associated with brick-and-mortar schools. "We don't have enough certified teachers to teach all of these subjects, and we want to be sure courses are rigorous and not watered down," explained a school administrator:

To have a class of three for Biology and a class of two for Geometry, that's not possible. We're having one class of 22 and they're getting the benefit of taking all the different subjects . . . It was an easy sell. (Personal interview, January 9, 2013)

Explaining further, there is no additional cost for running a VLL for the school district, because the students receive two full academic credits for completion instead of one. In other words, students are enrolled in two courses in one class period—one at the middle school and one at FLVS.

Multiple layers of support. The students benefit from taking online courses, while not completely letting go of the more traditional brick-and-mortar environment. They do this in a supportive environment that is highly individualized and differentiated which can be beneficial because the flexible schedule allows many students to accelerate and get ahead of schedule but if students fall behind they still can take extra time to extend their learning. To help learners achieve their best work, they receive support from a team comprised of the lab facilitator (gifted teacher), an online instructor, round-the-clock IT representatives, and other school and virtual school support staff.

To make the lab possible, the school provides a classroom with computer access and other technology required for the students to take courses at school, telephone access for online instructor-student phone calls, and the lab facilitator. The lab facilitator—a teacher who holds professional certifications for Grades 6 to 12 and the Gifted Endorsement—monitors the students while they work on their online coursework. It is her job to ensure that students stay on task, make progress in their course, and if possible, help students with their course or technology questions. The facilitator also coordinates with the online instructors to share pertinent information about each student's progress (e.g., grades on assignments), grade point average (GPA), whether or not students are on track, and other circumstantial information. Online instructors generally do same-day grading and return students' phone calls quickly. Online instructors and their instructional leader also make site visits and check up on the progress of students through face-to-face meetings. "We try really hard to geographically place teachers with labs so they can make those visits. Definitely somebody from FLVS is in that lab regularly, visiting and making sure things are going well, explained a FLVS administrator" (personal interview, December 18, 2012).

With all courses, additional help is available for students from both the lab facilitator and the online instructor when they need it. The students can benefit from the pace charts and they appreciate that it helps keep them on track (personal interview, January 7, 2013). One explained,

One thing I do like is that (the lab facilitator) has all these charts and other information for the course printed out, and posted for us. It's really helpful how she has all of these little helpful hints around; it makes it easier. (Group interview, January 7, 2013)

An FLVS administrator explained how online instructors are available by appointment for one-on-one help sessions, which can be done during the class period or beyond the school day (personal interview, December 18, 2012). Many of the instructors actively connect with students through live sessions using Blackboard Collaborate™ where they create interactive presentations, shared applications, and produced podcasts. Students can actually see, hear, and interact in many of these sessions with their

instructor through their computer in real time. They can also access live-help sessions accessible through their announcements page when they log in.

Establishing routines and tracking productivity. The lab facilitator has the responsibility to ensure that students are successful. Much of this is accomplished through progress monitoring, keeping students on task and coordinating with online instructors. Evidence from our analysis of both the observations and conversations with different stakeholders, revealed that the lab facilitator has been successful in establishing a consistent and predictable routine for what occurs in the lab. When students first come into the class, they move their desks around for what she explained is conducive to their learning. Some work side-by-side, especially when they are working on the same course, while others work alone. Some sit far away from the others, tucked away along the perimeter. A few wear headsets. All of the transitions between classes are smooth, and the environment feels safe and relaxing. Students get started quickly, either logging on to their computer or checking their progress using the charts on the wall. They are free to interact, both with the lab facilitator and with other students. “When we first walk in, we grab the computers and log on and get to work. . . . There’s a little bit of conversation that goes on between us as we talk. We usually get done pretty fast” (group interview, January 7, 2013). At the end of each class, they put their laptop computers back in the cart, and return their desks to their proper places. This freedom helps with the development of their interpersonal skills and self-regulation. Students act confident and content, and are more engaged than what an educator might expect.

During an interview, the lab facilitator explained that the different pace charts posted onto the wall are visual outlines of course objectives and activities that the students are required to accomplish, and as a student completes a task, they mark it off their chart (personal interview, January 7, 2013). This serves to not only encourage and motivate the students to stay on task but also helps the lab facilitator effectively track their progress. Every Tuesday, the lab facilitator obtains and reviews reports from the online instructors about each student’s progress, which she compares with the pace charts so she is aware whether a student is struggling or falling behind.

Personalized teaching and learning. This type of blended learning opens the door for more differentiated instruction and individualized learning. Courses are designed so that students do not have to do all of a module in the online course, if they already understand it. Or if they want an extension of their learning, they can take additional time to study or practice, or to clarify a misconception. The lab facilitator is also freed up to review progress and plan for individualized teaching, such as more one-on-one time to spend with a specific student or motivating each student to stay on task. Personalized learning helps draw attention and motivate these students in each of their specific interests, through both the choice of their course and a flexible pace. Students also appreciate having some control over their learning objectives and opportunities to work on their own.

The student-centered approach of the model allows for self-pacing within each course, so students can work at a speed consistent with their individual rate of learning. “You get to learn new stuff, like forensic science, and we get to do it at our own

pace, and not have someone forcing you to do it today, tomorrow” (group interview, January 7, 2013).

Providing access to accelerated coursework in various subjects. We found that as opportunities to earn college credit in high school continue to expand, there has been a trickle-down effect for middle schools to expand offerings of high school level courses. This trend has increased as the districts work harder to get students ready for standardized tests and college. The VLL also helps the school meet requirements of a new statute, *Academically Challenging Curriculum to Enhance Learning* (ACCEL; 2012), which became effective as of July 2012, requiring that eligible students have access to educational options that provide academically challenging coursework or accelerated instruction.

Students in this VLL choose from a variety of subjects, which all must be for high school credit and not otherwise offered at the middle school. By successfully completing these courses, students can enter high school having already (a) obtained more high school credits than their peers and (b) met the legislation’s requirements for completing an online course before high school graduation. When asked why they participated in the VLL, students in all three focus groups emphasized how much they appreciate being able to accelerate and get ahead of schedule (group interviews, January 7 and 8, 2013). “We’re actually getting high school credit, so when you’re in high school you can dual enroll in college.” By allowing them to take the accelerated courses when they are ready, the value of their subject mastery replaces seat time, allowing them to advance based on competency instead of what is standard: their age, attendance, and minimum achievement.

Another important point regarding having several courses offered in one room is that although these students were ready for acceleration, it did not mean they were capable to do this in every subject. It may have depended on their interest and aptitude. Having multiple courses and timelines to choose from provides opportunities for success on different paths. “Of course we want the course to be the student’s choice. That’s just a huge piece of it” explained one of the FLVS administrators. “If a student is passionate or talented at something, it will have a positive effect on their motivation and ability to learn about it” (personal interview, December 18, 2012). Students appreciate these options (group interviews, January 7 and 8, 2012). One explained,

I think if we didn’t have a choice, we’d be less motivated to complete the course. Whereas when we have the choice, it’s actually something we want to do so we’ll be motivated to do it and get it done faster.

Another student said, “You can take different classes than you could in a normal class here. Forensic science, for instance; we couldn’t do that here. We couldn’t even do it until we were in high school until we did it with FLVS.”

Moving at their own pace. This VLL uses a student-centered approach that both allows students to take as much time as they need as long as they do not get too far off pace,

and to move ahead when they are ready. Otherwise without this flexibility, they may become frustrated, disengaged and unmotivated, and not progress as quickly. When students were asked what they liked the most about the VLL a common response was because it allowed them to work at their own pace (group interviews, January 7 and 8, 2013). One explained, "I like how you can work at your own pace. You can work at home, too, so if you fall behind in school, you can work at home and stay [on track]." While another said, "You can go ahead as far as you can and you won't get in trouble. Of course you can't slack off."

Bridging the gap between online and brick and mortar schooling. Another benefit of the model is that it eliminates some of the disadvantages of having students take online classes separate from a brick-and-mortar school and school day. Some of the biggest disadvantages for online learning, which this VLL helps eliminate, include

- students who are not highly motivated, have poor organizational skills, or have poor study habits may have difficulty keeping up with the required work;
- isolation from their instructor and other students;
- access for students without computer and Internet at home;
- students without strong computer skills may find it too difficult without extra support; and
- students have extracurricular activities in addition to their other advanced coursework, which limits the amount of time available for taking courses outside the regular school day.

The lab also gives students a chance to get used to online courses, while not totally letting go of the brick-and-mortar environment they are more familiar with. The lab facilitator explained, "I do think it's a nice way to transition because you're getting coaching along the way versus now here it's yours, go for it. Good luck, so to speak. They need a lot of coaching." The same interview also described how it was especially important for those who are college bound, where online education may be the only option for some courses (personal interview, January 7, 2013).

Developing 21st-Century Skills

Findings revealed a large majority of students perceived their experience in the VLL helped them develop 21st-century learning and innovation skills. Interviews with the school, district and FLVS personnel supported these findings. New Common Core Standards and 21st Century Skills are in varying degrees of implementation across the country. Florida joined this collective effort to ensure that students are nationally and globally competitive. The Partnership for 21st Century Skills is a national organization that aims to improve education at the local, state, and federal levels through a comprehensive model of relevant content knowledge and specific skill sets. This framework consists of student outcomes and innovative support systems that will prepare students to face the demands and challenges of higher education coursework and the new labor

force. The skills identified in the framework also mirror the College and Career Readiness Anchor Standards developed as part of the Common Core Initiative (Common Core State Standards Initiative, 2014).

Students, FLVS/school administrators, and faculty involved with the VLL were asked about how, if at all, taking part in the lab had impacted several of the learning and innovation skills encompassed by 21st-century skills, including interpersonal and collaborative skills, communication, creativity, critical thinking and problem solving, curiosity, organization, and persistence and motivation. Results from the analysis of responses from both the focus groups and the written reflection assignment, revealed a large majority of students perceived their experience in the lab was helping them develop skills from all of these categories, which are organized below in order of most to least prevalent. Analysis revealed percentages for the proportion of students' responses classified to each theme ranged from 92% to 76%. Interviews with the school, district and FLVS personnel supported these findings and provided some context (group interview, January 8, 2013; personal interviews, December 18, 2012, and January 7 and February 4, 2013). All student quotes for this section are from focus group interviews conducted on January 7 and 8, 2013.

Organization. Specific examples that came up repeatedly, for students' organizational skills having improved, included that they were better at *note-taking*, and better able to *keep track* of their work. It was also apparent, that being more organized gives them a sense of *responsibility to themselves*. The lab facilitator explained that utilizing a computer for organization purposes was helping the students prepare for the future.

Organizational skills of a new age definitely. They're not keeping file folders and three-ring binders. Instead, they're learning how not to have 100 icons . . . and how to name and store their files in a way that they can find them. They're learning how to keep that stuff together. (January 7, 2013)

Persistence and motivation. Common topics for having stronger levels of persistence and motivation included *not giving up*, *being challenged*, and *staying on track*. Some commented that they have *always been persistent*. Others mentioned that being able to *resubmit assignments again* when they want to improve makes them more determined to do well. Students were thinking forward, "This helps us because in high school it's not going to be as easy as it is here. So it prepares us for not having a teacher guide us through every point but having to think critically about it." This was especially true, because they needed to be challenged. According to the assistant principal/curriculum coordinator,

These children are the ones that haven't been challenged up until now. We have parent conferences because the child is now getting pressure that they've never had before. We're all more persistent. . . . They learn self-discipline because they have to meet deadlines. (January 7, 2013)

Interpersonal and collaboration skills. Enhancing their collaboration skills was another impact of the VLL that participants described, including working effectively with

others, both in the lab and virtually/online. "I've learned to work with people over the phone and Internet," explained one student. While it was clear that students were challenged with working with others outside the walls of the classroom, this did provide them with some important skills.

Critical thinking and problem solving skills. Analysis revealed the experience provided opportunities that furthered the development of students' critical thinking and problem solving skills. Common themes discussed include *thinking more deeply and independently*, *communicating in foreign languages*, and using *computer related technology*. The students felt that the accelerated coursework helped them to develop these skills. It also had to do with working through the problems with the technology. According to the lab facilitator,

There are always technology barriers . . . They run into roadblocks and sometimes they're problem solving even when we're not asking them to. They look for a way around how they can do what they need to do without the approval to do it.

Curiosity. Many comments from the students, focused on their curiosity about the course content. Some talked about their *thought process*, or their curiosity spurring from the *use of technology* and having to *think ahead*. One administrator pointed out that providing choice for what course they take can play a role in boosting student curiosity.

Communication skills. Students expressed that the VLL helps improve their communication skills. Examples of this included that they were better at using email and/or the telephone. Other themes that emerged included *being more verbal*, *online discussion board communication*, *speaking to adults more*, and improved *foreign language skills*. In the virtual world, to communicate effectively, students need to master technology-driven tools such as discussion boards, email, and phone communication. An administrator explained,

Growth [in communication skills] is tremendous. They have to be able to articulate themselves either on the phone or in writing. There's not someone right there to pull it out of them. They have to call. They have to talk. (Group interview, January 8, 2012)

The lab facilitator saw this too.

In today's day and age, talking by phone is something that a lot of students need work on. . . . Most of the time, the first time they are terrified because you don't usually call your teacher on the phone. (Personal interview, January 7, 2012)

Creativity. A majority also perceived that the experience enhanced how creative they are with ways of thinking. They commented specifically about the work they were doing on interesting projects. Moreover, students reported that having alternate assignments and assessment options available in a course allows them to be more creative.

Students' Perceptions for How the VLL Compares to Brick-and-Mortar Schooling

Students were asked to reflect on how the experience with VLL accelerated coursework compared with what they experienced in their other classes at the school. Some said they liked the environment because it was different than what they experienced the rest of the day. They enjoyed how they could *work independently* and focus on their own, while others enjoyed *being with their gifted peers*. The most common responses for how the VLL was different was that it was *more challenging*, mainly for two reasons: because there was either (a) more self-regulated learning or similarly (b) more rigor because they had to think deeper and answer their own questions. A few found it easier in the blended environment because they could *go at their own pace*. Many reflected that they had to be more active learners, be more autonomous or *self-directed* and take charge of their own learning. Some of the students were struggling with the *longer length of the lessons*, or with what they believed were *vague instructions*.

More challenging—Self-regulation of learning. Students seem to enjoy that the VLL allowed them to direct their own actions, and make decisions on their own. They also talked about how this made learning more challenging.

When you don't have a teacher hands-on to help, you have to apply yourself more, think critically, and do more problem solving. It's just tougher because the teacher isn't there to guide you every step of the way. Of course you can call her, but it's harder by phone.

Another student explained,

It's harder than our other classes because in our other classes, they walk us through it, they're with us, and they tell us what we have to do for that day. But in this class, you have to dig deep in your brain and get the answers from yourself, and you can tell yourself what you're going to do today.

More challenging—General. Several students remarked on how they enjoyed being challenged, for other reasons. For example, they appreciated that they were able to take accelerated coursework. "It's hard and challenging. It's also satisfying. Overall it's somewhat enjoyable to do what we're doing because of the challenge. We're able to do this where most kids here aren't." Still for a few students, they admitted that they would prefer to take the accelerated courses in a more traditional setting. "For me, FLVS is a lot harder than learning any high school course in a classroom. I think it is easier learning face-to-face instead of on the computer."

Length of lessons is longer. Like one might expect, the first time taking high school courses for these students was a surprise for the amount of work involved. "The length of the lessons. We're just in seventh grade and we're taking a high school course. Why can't they just make it more reasonable?" One thought the VLL high school course was more time-consuming than the high school courses being offered at the brick and

mortar high school. "Each lesson is really long. My brother is in high school and I do more work than him."

Less challenging. It was interesting, that while some found the VLL more difficult than their other courses, there were also those who thought it was easier. This was likely due to how they could adjust their own pace.

I think it's easier because you can go at your own pace. You can work on an assignment whenever you want, then you can finish the assignment when you want, and start another assignment anytime you want. It's focused on you.

They liked having the ability to stop and rewind. "I think it's a lot easier because you can look at what you're being taught instead of just the teacher talking to you. You can read it over and over again."

Less explicit instructions. When comparing their more traditional classes to the VLL it was clear that having more open-ended assignments frustrated some. "Some of the instructions are very vague. They don't tell you exactly what they want."

Working independently. They appreciated the opportunities that the VLL environment gave them, to work independently, in a space all their own. Sample quotes for this include, "I like where you're not in an environment with a lot of other students" and, "I like the quiet. I like that we have our own space to learn in our own environment and how unique it is. There's nothing like it around."

Being with gifted peers. And finally, some remarked on how much they appreciated having time with their gifted peers. The way students were heterogeneously grouped for the VLL, allowed for this for the one period a day. "I like this class because most of the day we don't see each other. Just talking to another gifted person is really kind of like talking to someone on your level."

Lessons Learned and Recommendations for Others Implementing VLL Programming

The lab facilitator and school/district administrators were asked to reflect on lessons learned and to provide recommendations for other schools implementing a VLL (group interview, January 7, 2013; personal correspondence, February 2013). Their suggestions are summarized below.

Advice from the lab facilitator

1. Have a comprehensive list of all technology needs for the school and IT department before the start of the school year. Software download permissions and browsing restrictions take time, and can cause unnecessary interruptions in students' workflow.

2. Gifted students still need additional enrichment activities, such as community projects and volunteer activities outside of the VLL coursework.
3. Having an effective system for keeping up with the progress of students is important.
4. Provide lab facilitators with ongoing effective training and support, and opportunities to visit other VLLs as a way to gain additional knowledge about other working labs.
5. Provide multiple choices for content areas and suggested timelines. This will give students opportunities to excel on different paths, with regard to their talent and/or interest.

Advice from administrators

- Having an incentive or buy-in from the parents may be necessary for the students' success in some of the more fast-paced courses.
- Students need computer access, and Internet connectivity outside of the VLL.
- Providing more details and discussion about the different tracks at orientation to help students understand the benefits of taking advanced courses or how it will affect their high school program of study.
- The demand for offering middle school students high school course options is sure to grow. Expand this to other students.
- One district policy modification important to many stakeholders was changing the way valedictorian and salutatorian was calculated. Now, a separate GPA is calculated for the purpose of valedictorian and salutatorian selection by only factoring in high school credits taken after students have moved to a high school campus, instead of including high school credits taken in prior grades.

Summary of Findings

Findings from this case study reveal that adopting VLL programming—specifically online instruction that takes place in brick-and-mortar public schools using the lab rotation variant of the Rotation model (Staker & Horn, 2012)—can be an effective means for providing accelerated coursework to exceptional middle school students who are gifted. Students are successful in completing advanced coursework and appreciate the opportunities to socialize and learn alongside like-ability peers for part of the day. Other benefits supported through this research include efficiencies from distributed staffing, extending course offerings to allow for more personalized teaching and learning, supporting the development of 21st-century skills, and bridging the gap between online and brick and mortar schooling. Students perceive that taking high school classes in earlier grades will allow them to take more college classes in high school, which they deem important. They also prefer taking these during the school day, rather than after school or in the summer, when they have other commitments. They did, however, have concerns with the longer length of the lessons, level of rigor being too difficult, or with what they believed were vague instructions in a course. And

while it was clear that students were challenged by working with others outside the walls of the classroom, this did provide them with some important skills.

Personalized learning through both the choice of their course, and a more flexible pace helps draw attention and motivate these students in each of their specific interests. Students appreciate having some control over their learning objectives and with the course content, the faster pace, working independently, being with gifted peers, and the challenge of obtaining advanced credit for high school. It is also important to point out that VLL may not be the best option for all of these learners, however. While almost all students in this study valued being able to get ahead, there were a few who felt the pace of taking these advanced courses was too demanding—either because they were worried about making good grades or balancing a heavy workload with the demands of extracurricular activities.

From the teacher/administrator perspectives in this study, the VLL has a positive effect on participants' motivation and learning because it provides additional flexibility to students, and enables flexible pacing while still receiving guidance from the lab facilitator. While many stay ahead of schedule, some fall behind from time to time and need support. Large displays of pace charts on the walls, access to the lab facilitator, and opportunities to collaborate with the online teachers can be helpful factors in motivating students and keeping students on track. Another benefit is that the experience gives students a chance to become accustomed to online courses, while still receiving support in the context of the brick-and-mortar classroom that they are more familiar with.

The gifted students like that the VLL is different than the rest of their day. Some like it because they prefer, working independently and being with their gifted peers. These preferences are consistent with Rogers's (2007) research findings that these options should be provided on a regular basis for gifted learners.

The most common responses for how the VLL is different included that it is more challenging, mainly for two reasons: There is either (a) more self-regulated learning or (b) more rigor because they had to think deeper and answer their own questions. A few find it easier in the VLL as they could move ahead at their own pace. Many reflected that they have to be more active learners, apply themselves in the VLL, be more autonomous or self-directed and take charge of their own learning. Some of the students struggle with the longer length of the lessons, or have difficulty interpreting what they believe there are vague instructions.

Limitations

There are some limitations of this study. First and foremost, because a case study focuses on one school and a single instance of a VLL, the issue of generalizability looms largely here. Another limitation is that there may have been some bias, created through the belief structures that were shaped from experiences of the researchers. This issue for researcher effects is that of competence, which we believe was sufficiently demonstrated by using verification and validation procedures for enhancing the quality of analysis recommended by Patton (1999). Moreover, having other stakeholder perspectives—for example,

parents, or past students from the VLL—would have increased generalizability of the findings.

Discussion

This case study provides an in-depth look at a blended online learning environment and helps describe an emerging model for meeting the needs of gifted and talented learners in schools. While the issue of generalizability looms larger here than with other types of research, the descriptive account does provide useful information for others who might want to implement a VLL with gifted and talented learners, which infuses a brick-and-mortar style classroom with online instruction. Follow-up research is recommended to increase the understanding as to how the VLL experience will affect these gifted students in high school and beyond.

Results confirm that this type of blended learning, provides for all five of the lessons Rogers's (2007) gifted and talented research synthesis suggests, including daily challenge in their specific area of talent, regular opportunities to be unique and work independently in their areas of passion and talent, various forms of subject- and grade-based acceleration as their educational needs require, opportunities to socialize and learn with like-ability peers, and differentiated instruction in pace, amount of review and practice, and organization of content presentation. Providing gifted learners with appropriate choices for accelerated coursework in their area of talent or interest in this type of blended-learning model can help them meet their potential for academic achievement, while remaining within their brick-and-mortar environment. However, while the middle school students enjoy being more self-directed and take charge of their own learning, some do struggle with taking advanced (high school) courses, for the first time. These concerns—mainly with making perfect grades, or balancing loads of homework with their extracurricular activities—makes having strong layers of support with realistic expectations for these exceptional students, even more important.

VLL programming provides a number of benefits, including a more student-centered approach that allows self-pacing, more consistent with their individual rate of learning. It allows for an accelerated pace, with the opportunity to obtain more high school credits than previously available, while still in middle school. However, there is some concern that students may need help adjusting to the new level of rigor, longer length of the lessons, or what they believe are vague instructions for advanced classes. Another important benefit is that the VLL provides students the opportunity to socialize and learn in a comfortable environment alongside their like-ability peers. Other research supports the implementation of ability or performance grouping, with positive effects on self-esteem (Gentry & Owen, 1999; Rogers, 1998) and perceptions of giftedness (Zeidner & Schleyer, 1999). Otherwise, students can become easily overlooked, particularly if they are performing well academically (Brulles & Winebrenner, 2012). Other benefits supported through this research include extending course offerings, in some cases beyond the end of the traditional school year, to allow for more personalized teaching and learning, supporting the development of 21st-century skills, and bridging the gap between online and brick and mortar schooling. It won't be long,

before all high school graduates in Florida will be required to earn credit from at least one fully online course.

The lab also gives students a chance to get used to online courses, while not totally letting go of the brick-and-mortar environment they are more familiar with. Other findings are that it can be reasonable to implement during regular class periods within the school day, satisfies parents and students, and can be done under tight monetary constraints.

The VLL also eliminates some of the biggest disadvantages for online learning, including (a) not having a face-to-face teacher to provide encouragement and other support for those students who may be less motivated, disorganized, or do not have the study habits needed to “keep up”; (b) isolation from their instructor and other students; (c) lack of home access to computer and Internet; (d) not having sufficient computer skills without extra support; and (e) having to take courses outside the regular school day can get in the way of extracurricular activities.

While there is no doubt that the rise and evolution of K-12 blended learning provides an important focus for more research, part of the answer for ensuring high expectations and achievement for gifted and talented learners is allowing students to have the freedom and flexibility that comes with these emerging environments.

Guiding Questions for Focus Groups and Reflection Topics

- What does a typical day look like?
- Why did you decide to be enrolled in the VLL?
- How does this class compare with the other classes you experience (quality, specifically comparing learning online vs. face to face; quantity of work; rigor of work; and level of motivation)?
- How would you describe the environment (comfort level, teachers’ role, time on task, and how it compares to other classes)?
- What kinds of support for this course do you receive at home? Do your parents get involved (level of parental involvement, and how that compares to other courses)?
- Thinking back on the time you have spent in the VLL. What do you like the most about it? What do you dislike?
- For next year, what suggestions do you have to improve the VLL?
- Would you recommend that other schools adopt a VLL for other gifted students, like you?
- Is there anything I left out?
- Is there anything else you would like to share?

Students were asked to expand, when topics came up, for how the VLL may have affected students learning and innovation skills, including collaboration, communication skills, creativity, critical thinking, curiosity, organization skills, persistence, and real-world problem solving.

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