Credit Recovery in a Virtual School: Affordances of Online Learning for the At-Risk Student

KEVIN OLIVER
North Carolina State University, United States
kmoliver@ncsu.edu

SHAUN KELLOGG
North Carolina State University, United States
sbkellog@ncsu.edu

This paper summarizes evaluation findings about a high school credit recovery (CR) program as solicited by a state-sponsored virtual school in the United States. Student and teacher surveys explained why CR students failed previous instances of face-to-face courses and defined how the online CR model helped these learners overcome both internal issues of self-direction and time management and external issues of teacher support and feedback. Comparisons between the CR course group and general studies and honors course groups suggested several significant differences of interest that were interpreted by qualitative comments and prior research. Comparative data helped to define unique needs of the CR population (e.g., may require added technology and support to participate online), areas of success in the CR program (e.g., CR students report learning more online), and areas for expansion in CR courses (e.g., may benefit from added collaborative, project-based work).

INTRODUCTION

Nearly one-third of American students do not graduate from high school (Duffey & Fox, 2012; Rennie Center, 2009). Factors associated with the dropout dilemma include: increased academic standards (Lillard & DeCicca, 2001), economics (Rumberger, 1987), disengagement from the school community (Stanley & Plucker, 2008), and grade retention (Jimerson, 2001). Students who are retained, particularly in the 9th grade, or fail to accumulate enough credits to graduate on time, appear to be at a much higher risk of dropping out than their peers (Christian, 2003; Letgers & Kerr, 2001; Shepard & Smith, 1990; Zegarac & Franz, 2007).

In response to this national problem, the Dropout Prevention Act was established to provide grants for school dropout prevention and reentry programs (U.S. Department of Education, 2002). One such program is credit recovery (CR) aimed at helping students recover credits from classes they missed or failed, in some cases allowing students who would have otherwise failed a grade or not graduated on time to keep pace with their peers (Brown, 2012; Duffey & Fox, 2012). While CR includes supplemental programs in traditional settings, distance-based options for CR have been expanding and account for as much as one-third of enrollment at Florida Virtual, one of the nation's largest virtual schools (Dessoff, 2009; Trotter, 2008; Watson & Gemin, 2008). In Illinois, CR courses represent the largest type of online course offered to high school students, and 74% of principals cite retaking failed courses as one of the most important reasons for offering online courses (Picciano, Seaman, & Day, 2011). More than 62% of U.S. school districts participate in distance CR programs, with a higher percentage of city-based districts (84%) reporting participation than rural districts (53%) (Queen, Lewis, & Coopersmith, 2011). Online CR programs tend to be provided by commercial vendors (e.g., *Apex Learning, Novanet, Plato*) or through state-run virtual schools, are typically self-paced and individualized, follow a behavioral model promoting mastery learning of discrete skills, take place in-school either during or after regular hours, and use a blended model supported by certified teachers assigned to a relatively small group of students (Chen & Hirumi, 2004; Donahue Institute, 2012; Fratt, 2006; Munger, 2009; Rennie Center, 2009; Trautman & Lawrence, 2004; Trotter, 2008; Watson & Gemin, 2008).

As with any type of program, online CR poses potential advantages and disadvantages for the at-risk student demographic they typically serve. Watson & Gemin (2008) argue that the self-paced and flexible nature of online CR programs is well suited to the at-risk population because they allow instruction to be tailored to their academic needs, help to remove the stigma of CR, and reduce the difficulties and stress associated with a typical class-

room setting. Other cited advantages are the ease at which technology enables students and teachers to frequently monitor progress, to target specific academic needs, to increase engagement, and to earn back credit at a faster rate (Trautman & Lawrence, 2004). Despite these stated advantages, the characteristics needed for students to succeed in an online environment may not be well matched to the at-risk population they are intended to serve. Roblyer and Marshall (2002) created and tested an instrument that was found to discriminate between successful and unsuccessful students in Virtual High School (VHS) courses. Constructs associated with successful behavior included internal motivation, responsibility, self-esteem, goal setting, time management, and achievement motivation. In contrast, Kaufman & Bradby (1992) found students at risk of school failure did little homework, had poor grade histories, were unprepared and frequently tardy or truant, inattentive or passive, and performed below proficiency level in math and English.

Roblyer and Marshall (2002) also found self-reported technology skills to be a predictor of success. Unfortunately, in a recent study, Oliver, Osborne, Patel, and Kleiman (2009) found that CR students self-reported significantly lower technical skills when compared with accelerated students, possibly explained by their lack of equitable access to technology resources and instruction, a related barrier for at-risk students. Brown (2000) noted that not only were these students less likely to have access to physical resources at home and school, but their use of computers at school was more likely to emphasize drill and practice software resulting in a less challenging curriculum. This emphasis on remedial or deficit learning was also found in studies related to commercial providers of online CR programs (Kim & Taylor, 2008; Munger, 2009). In addition, the required reading skills needed to be successful in reading-dominant online programs only fortifies this barrier. In a study of CR students enrolled in a program implementing *NovaNET* online courseware, Munger (2009) found reading level to be a significant predictor of course completion with a minimum 8th grade reading level needed for success. A teacher assisting 12th grade CR students using Apex Learning's online courseware noted student difficulties from the amount of reading demanded of them (Trotter, 2008). Some commercial vendors have attempted to address these issues with modified programs that decrease the reading level and the amount of required reading while adding support tools such as audio and video components (Fratt, 2006; Trotter, 2008).

Research on the effectiveness of online CR programs assisting students in earning back credit or grade promotion is mixed and seems at least partly related to the quality of programming and support. Christian (2003) investigated a ninth grade CR program largely involving self-paced software for skill remediation with no significant impact on promotion to tenth

grade. Alternatively, the Donahue Institute (2012) reported 79% of at-risk high school seniors, aged 18 and older, just a few courses shy of graduation, earned their diplomas after using Apex Learning resources. Part of the program's success was attributed to lab-based instructors and case managers. Munger (2009) studied a fully online CR program involving self-paced coursework through *Novanet* in computer labs. Aside from the significant relationship between reading level and course completion, less than one-third earned credit at a pace equal to or greater than they would have in a traditional classroom setting and passed. Two separate evaluations of a CR program implementing *Novanet* in North Carolina yielded mixed results with students earning credits toward graduation but low achievement measures in regard to increased GPA and End of Course test results (Bulgakov-Cooke, 2010; Harlow & Baenen, 2002). Alternatively, Watson and Gemin (2008) cite data from the Florida Virtual School where the passing rate of CR students was similar to the general population, using an inclusion model with CR and non-CR students mixing in fully online courses rather than separate blended labs. Also, Trautman and Lawrence (2004) report students using the self-paced *A+dvanced Learning System* had higher attendance rates and earned credits at twice the rate of the general student population. Further, English language learners and economically disadvantaged students passed the Texas Assessment of Knowledge and Skills (TAKS) at a rate significantly greater than the general school population and comparable state populations.

Promising practices for supporting online CR students have emerged, including blending instruction and pre-screening for student support. Most online CR programs have a significant face-to-face component to extend student support with face-to-face teachers used to help students understand online content with timely support (Dessoff, 2009; Watson & Gemin, 2008). For CR programs that make use of school computer labs, maintaining a low teacher-student ratio and staffing programs with highly qualified teachers have also been recommended (Bulgakov-Cooke, 2010; Fratt, 2006; Martin, 2003). Finally, online CR programs may not be suited to every CR student. Students with low reading levels, limited technical proficiency or confidence, and low motivation or self-direction, are likely to have difficulties in an online environment. Researchers have recommended the use of a pre-screening process to identify students who may have difficulties in an online environment so that additional support could be provided to ensure success (Archambault et al., 2010; Munger, 2009; Roblyer & Marshall, 2002).

Watson and Gemin (2008) recognized that while success stories about online CR programs are abundant, there is a need for research. Existing CR research from commercial vendors tends to focus on course completion rates, while there is a need to "examine the quality of student learning expe-

riences in virtual school environments, especially those of lower performing students," to help virtual schools understand how to better support the increasing number of students in categories such as CR (Cavanaugh, Barbour, & Clark, 2009). While literature suggests that online CR can be successful in helping students earn credit towards graduation with proper supports, concerns over quality and instructional equity remain. "Instead of challenging students to raise their performance to the level they must reach to be successful, too often CR 'solutions' have lowered the bar for passing ... Among the worst offenders in this regard are some products and programs that call themselves 'online'" (Watson & Gemin, 2008, pg. 15).

METHODS

Purpose and Design

A state-sponsored virtual school in the United States elicited an external evaluation from the authors of this paper, to determine program successes and areas for improvement. Students and teachers were surveyed with comparisons made between CR, general studies, and honors groups. This paper reports on significant differences identified between CR and other groups and shares qualitative comments from students and teachers to help understand the unique needs and outcomes of this population. An embedded mixed methods design was selected to guide the study with patterns suggested by quantitative data further informed by qualitative data.

Participants and Credit Recovery Profile

Online surveys were completed by 862 students and 128 teachers about online courses administered by a state-sponsored virtual school in the United States during a recent summer session (see Table 1). Courses were offered in four groups during this session, including CR, general studies, honors, and advanced placement (AP). The first three groups had a sufficient cell size on which to base comparisons. The school offered ten CR courses in four content areas during this session: English, math, social studies, and science.

Table 1
Percent of Students and Teachers Responding to Surveys by Course Groups

Course Groups	Students	Teachers
Credit Recovery Surveys Received	22.4% (n=193)	28.1% (n=36)
General Surveys Received	46.3% (n=399)	52.3% (n=67)
Honors Surveys Received	28.8% (n=248)	19.5% (n=25)
AP Surveys Received	2.5% (n=22)	0% (n=0)
Total Surveys Received	n=862	n=128
Total # Summer Enrollments	7484	202
Overall Survey Response Rate	11.5%	63.4%
Total # Summer Credit Recovery Enrollments	2012	86
Credit Recovery Survey Response Rate	9.6%	41.9%

A further description of CR students and teachers is now provided, given the focus on this population. The 193 CR students were 67.8% female, 32.2% male, with the racial distribution: 48.6% white, 33.8% African-American, 4.9% Asian, 4.2% Hispanic, and 7.7% multiracial. The 36 CR teachers were 83.9% female, 16.1% male, with the racial distribution: 90.3% white, 6.5% American Indian, and 3.2% multiracial.

Students were asked to self-report the typical grades they received in school on a scale from mostly Fs = 1 to mostly As = 5. When comparing CR to general studies and honors students, CR students did report significantly lower grades than either general studies or honors students (see Table 2). Grades were not overly low, however, as 65.8% of CR students reported typically receiving As or Bs in school, and 28.8% reported typically receiving Cs.

Table 2
Main Effect of Course Group Among Students Self-Reporting Typical Grades Received in School

Survey Items	df	F	p	η2	Means (SD) % reporting "mostly As" or "mostly Bs"		
					Credit Recovery	General Studies	Honors
Typical grades received in school.	2, 655	15.48	< .001	.045	3.90_a (.92) 65.8%	4.39_b (.81) 85.6%	4.27_b (.93) 78.2%

Note: means with the same letter in the subscripts do not significantly differ from one another at the .05 level according to REGWQ tests.

In terms of online course experience, CR students reported taking a mean of only .61 online courses prior to the survey, although this limited experience did not differ from students in general studies or honors courses. A significant difference was noted when comparing the online teaching experience of teachers of different course groups, $F(2, 106) = 14.75$, $p < .001$, $\eta^2 = .218$. Honors teachers reported teaching a mean of 5 online courses prior to the survey, compared to only 3.4 courses for general studies teachers, and 1.35 courses for credit recovery teachers, with post hoc tests indicating significant differences between all three groups.

One open-ended question on the survey asked students why they enrolled in their CR course. Ninety-three students or 48.2% of the sample reported they needed course credit to move to the next grade level or to graduate, which may have involved failing a previous instance of the course (unstated), and 46 students or 23.8% of the sample specifically stated they failed a previous instance of the course with a need to make up course credit.

Data Sources

The conceptual framework underlying this evaluative study was internal as developed by the virtual school. The school sought formative feedback on seven overall goals to continuously improve their programming: foster student learning and success with resulting advocacy for the virtual school, adequately prepare students for virtual learning and minimize barriers to success, deliver quality course content, deliver quality teacher facilitation, and leverage multiple sources of student support from administrators, designated e-learning advisors at each school, and the community. One online survey for students and one online survey for teachers were developed in consult with virtual school staff to inform progress toward the school goals. Virtual school staff reviewed and edited question items written by evaluators. Items were predominantly multiple choice on a five-point Likert scale from strongly disagree to strongly agree. Students and teachers who indicated they were involved in CR courses received a unique survey branch with five additional open-ended questions about their reasons for taking CR courses and what they offered above and beyond courses they may have failed previously. In addition, CR students and teachers were presented with a list of 17 strategies recommended for CR programs in the literature (Menzer & Hampel, 2009, Roblyer, 2006; Watson & Gemin, 2008), and asked if they agreed these strategies would influence their success. Supplemental qualitative data from CR students was rich, resulting in more than twenty single-spaced pages of comments.

Analysis

Student and teacher surveys contained both Likert-scale and open-ended items. *SPSS* was used to analyze Likert items. To determine the percent of respondents who agreed or strongly agreed with items, the frequencies function was used with valid percents reported. One-way ANOVAs were conducted to compare course groups (i.e., CR vs. general studies vs. honors). If the resulting F statistic was significant at the .05 level, that item was flagged. Effect size estimates (η2) were calculated for flagged items by dividing the between-group sums of squares by the error sums of squares. If the η2 value was at least .009, a small but potentially trivial effect size according to Cohen's guidelines (1988), that item remained flagged. Items for which ANOVAs did not result in significant F values and did not have effect sizes that were at least .009 were not included in the narrative discussion on group differences. Post hoc tests were employed to conduct pairwise comparisons on the means for the items retained for discussion. Specifically, the REGWQ (Ryan/Einot/Gabriel/Welsch) procedure was used to make pairwise comparisons between students in different course groups and teachers in different course groups.

Responses to open-ended questions were imported into *NVivo* qualitative analysis software, with each question individually open-coded. Open codes included phrases like "no attendance policy in online courses," "courses accessible any time," "mastery-oriented courses allow for revision." Codes were then compared across the open-ended questions to identify similar and dissimilar categories. For example, the sample codes mentioned previously were grouped into a category about online courses allowing for "more time to complete work." Finally, all categories were compared and ultimately grouped into two themes or affordances of online learning. For example, the "time" category mentioned previously reflected one of several online learning factors that helped students manage problems with self-discipline.

Limitations

This study partially relies on comparisons across course groups (credit recovery, general, honors) to reveal any differences in course elements such as available resources, teaching strategies, and course activities. Given the course groups are widely varied (e.g., different students, instructors), any significant differences between groups must be examined cautiously. For example, the finding that credit recovery students were more likely to use computer labs before/during/after school could mean they are less likely to have a computer at home, or it could mean their course content is more likely to require sitting in front of a computer for longer periods of time to work through remedial-type programming.

Further, there is content variety within course groups, with our CR group made up of four different subject areas. The Donahue Institute (2012) found CR students were less likely to pass more challenging and time-consuming math and science courses compared to humanities courses, thus it stands to reason students in the present study might have differing reactions to the CR program based on course-specific factors not accounted for by placing these students in one group.

FINDINGS

Issues Associated with Student Failure

CR students were asked on their survey, "if you did not pass this course the first time you took it-face-to-face, please list the top few reasons why." While 22 students or about 11.4% of the sample reported they had never taken the course before, a majority of students indicated they were addressing a failure via CR. The reasons cited for failing a course generally fell into one of two categories--a lack of self-discipline primarily and teaching issues secondarily.

Seventy-two students or about 37.3% of the sample reported self-discipline issues resulted in their failure prior to taking a CR course. Self-discipline issues described by students included being "lazy" and not studying (n=22), not doing homework or turning in assignments (n=20), being late to class or missing class too often with absences (n=14), not paying attention in class or sleeping (n=12), and "playing around" in class or being distracted by friends (n=4):

Well the number one reason I didn't pass the course is because I was a lazy kid.

I didn't do the homework. I didn't study for test.

I didn't pay much attention and had messed up priorities.

Being distracted, by my friends.

Twenty-eight students or about 14.5% of the sample blamed a teacher for their failure prior to taking a CR course. Five students simply noted they did not get along with their teacher, while 22 students cited inadequate teaching methods such as poorly explaining material, moving through material too fast, and not providing help:

The teacher I had made things complicated when she explained things. She over explained things, in a sense.

I didn't get the help that I needed. Teacher went too fast.

She failed to give extra help. She made learning very difficult and over half of our class failed.

Why Credit Recovery Makes a Difference

After students reported reasons for failing courses, they were asked if these reasons had been improved by the CR course they were taking. Although 15 students or about 7.8% of the sample indicated CR courses had not addressed issues leading to failure, a majority of students reported that their CR courses were helping to address both self-discipline and teaching and support issues.

Students suggested their self-discipline issues were being addressed online because there were fewer distractions from peers when working online (n=2), fewer distractions from other/multiple classes when working on a single CR course in the summer (n=2), attendance was not an issue online (n=3), courses could be worked on any time (n=5), students could take their time and self-pace through material (n=9), materials could be reviewed until mastery was achieved (n=5), and parents could monitor online work and encourage the student from home (n=2):

I just think I concentrate better when it's just me and the work!

Attendance didn't matter and I'm able to pace myself on the assignments.

Now that I have this online class I can go at my own pace. I also have more time since it's online. I can have more time to complete assignments and stay ahead.

It is easier when you can go back and review things and work at your own pace.

In addition to helping students address self-discipline issues, ten students noted that CR courses had also addressed teaching issues with more supportive instructors who provided help, explanations, and feedback:

Mrs. X is great teacher. She is very patient. If you don't understand things she will show you and explain to you more than one way. She goes out of the way to help.

The teacher always gives you feedback on your work. My teacher has been there to help whenever need be.

You always know where you stand in the class, what your grade is.

Another open-ended question asked students what, if anything, was different about their CR course that made it not simply a repeat of the face-to-face course they had failed. The most common theme differentiating CR from failed courses related to time. Ten students noted their CR course allowed them to work any time they wanted, while eighteen students noted their course allowed them to self-pace through material and take their time, resulting in less stress. Nine students noted the design of their online courses actually gave them extended deadlines and second opportunities to revise work. Two students noted it was easier to concentrate on just one subject or course taken in the summer months.

I don't feel as stressed with an online class and I can sit down and work at my own pace. In my face to face class I was making a 67 in the class and with [credit recovery] I currently have a 90. So that just shows when I can sit down and have all the time I need to focus I can get my work done and pass my class.

You can keep retaking assignments until you pass them.

The ability to keep doing the homework until I understand why I got the problems wrong.

The second most common theme differentiating CR from failed courses related to teaching. Sixteen students noted they had more one-on-one teacher help in their CR course, and five students noted their teacher employed different teaching methods that were more in line with their learning styles. Two students noted the online course provided for opportunities to receive help not only from the teacher, but also from family members. Six students appreciated the added supplements teachers provided in online courses beyond their textbook:

The difference is that I have more time to go over what I am not understanding and it is like one on one teaching. It is not like in a class where the teacher does not have the time continually to explain it to you if you don't understand.

Well I failed algebra one due to me not adapting to my teachers teaching methods, then passed with flying colors the second time.

Teacher gave internet sites with examples to look at--looked at these before taking the pretests to review and that helped to pass out of a lot of modules.

Teachers were also asked what was different about their online CR course that made it not just a repeat of the courses students had failed. Like many students, seven teachers reported their course was different because students could self-pace through material and take as much time as needed on assignments. Also like students, 13 teachers suggested the mastery-based design of CR courses was motivating to students, as they could quickly move through material they learned or test out of material they already knew: "These students aren't always low-level learners and the 'boredom' they experience can be what is causing them to tune out. They are allowed to focus on the objectives they need while moving past those they don't." Teachers also touched on the teaching theme in their comments with five teachers noting their courses provided for more individualized attention. The biggest difference between failed face-to-face and online CR courses according to 19 teachers involved new teaching strategies and interactive Web tools purposely integrated into courses to engage students:

[We] vary teaching methods throughout--notes, videos, Gizmos, SAS activities. [Students] probably see more variety than they would in a regular classroom.

It must be completely different--the assignments are unique, with a good range of audio, visual, textual, and technological lessons. I don't think any one teacher could assemble this range of lessons and resources.

There are lots of interactive Web sites and videos ... instant messaging. All of these aspects serve to embrace their culture/generation in a way that lets them feel "set up to succeed."

When students were asked why they expected to pass their CR course this time as opposed to when they first took it, self-discipline again came to the forefront with 40 students or approximately 21% of the sample reporting they were simply doing the work and putting in the "time," "effort," and "attention" required: "I paid more attention to what I was reading and did all my work and studied a lot more than the first time I took the course." Many students again touched on the theme of "time," noting they expected to pass their course this time because they could work any time (n=3), they could self pace and take their time (n=5), they could revise work (n=7), and they had fewer distractions (n=1). Many students also touched on the "teaching" theme again, noting they expected to pass their course this time because of added assistance from a teacher (n=12), different teaching methods (n=2), or from family members (n=1).

CR teachers were asked a similar open-ended question: If you think more students will pass your online CR course as opposed to the first time they took the course face-to-face, why do you think they are more successful online? Like many students, ten teachers reported their students were simply more motivated the second time around to pass a given grade or move up to the next grade level. Also like many students, teachers touched on the theme of "time," noting many students were more successful online because they could work any time (n=4), they could self pace and take their time (n=11), they could revise work (n=2), and they weren't as distracted or dissuaded by peers when working independently online (n=2):

Many of my students failed English III the first time because of their attendance. They seem to be more willing to take a course and stick with it when they can go on their own time.

Being able to move at their own pace, on their own schedule is beneficial to many.

They have the chance to retake assignments/quizzes/tests until they reach mastery.

By using Pronto and email, they can get help without any other students knowing. Many times in the f2f class, they are embarrassed to constantly ask questions and look "dumb."

Eleven teachers also touched on the "teaching" theme by suggesting one-on-one help and increased feedback in online CR courses were helping students succeed:

In teaching this class, I have 24 students (46 actually with the 2nd section I am teaching) during the summer term. I am not working otherwise, so they get my attention for 8-10 hours/day. When I teach in the classroom, I have 165-175 students/year (non-block) and I could never give them this level of attention.

They have a one-on-one relationship with me and don't feel like a face with the crowd. Several have indicated that the immediate feedback has helped them as they went days or weeks without getting test results in their f2f classes.

Credit Recovery Students' Learning

When asked if they were succeeding in their online course, 84.7% of CR students agreed or strongly agreed, and this percentage was not significantly different from general studies or honors students. When asked if students were succeeding in their online course, 77.4% of CR teachers agreed or strongly agreed, which was similar to general studies teachers (71.0%) but significantly lower than honors teachers as might be expected (92.0%), $F(2, 115) = 7.52$, $p < .05$, $\eta^2 = .116$. When asked what percentage of students would pass their CR course, teachers reported a mean of 61.4% would pass with a divergent standard deviation of 19.6%.

When asked how much they were learning online compared to similar face-to-face courses taken, 62.4% of CR students reported they were learning "a little more" or "much more" online, which was significantly more than general studies (34.8%) or honors (39.1%) students, $F(2, 787) = 25.36$, $p < .001$, $\eta^2 = .061$. When CR teachers were asked the same question about their students, they were considerably more reserved with only 16.1% reporting students were learning "a little more" or "much more" online, which was similar to general studies teachers (28.3%) but significantly less than honors teachers (44.0%), $F(2, 113) = 3.65$, $p < .05$, $\eta^2 = .061$.

Seven survey questions were posed to students and teachers to determine if their courses were helping to develop 21st century learning skills. CR almost always had a higher percentage of students agree or strongly agree their courses were supporting the various skills. On one item, significantly more CR students agreed or strongly agreed their courses were supporting technology literacy skills (83.9%) than either general studies (55.9%) or honors (66.4%) students, $F(2, 706) = 22.32$, $p < .001$, $\eta^2 = .059$. On five items,

significantly more CR students agreed or strongly agreed their courses were supporting group collaboration skills (82%), learning and innovation skills (78%), information literacy skills (72.2%), life and career skills (67.9%), and civic literacy (46.2%), compared to at least one other course group.

The percentage of teachers who agreed or strongly agreed online courses were supportive of 21st century skills generally did not differ across course levels, with three exceptions. Significantly more honors teachers agreed or strongly agreed courses were supporting an understanding of civic literacy (82.6%) than either general studies (61.4%) or CR teachers (40%), $F(2, 103) = 5.95$, $p < .05$, $\eta^2 = .104$. Also, significantly more honors (95.7%) and general studies teachers (88.1%) agreed or strongly agreed courses were supportive of group collaboration than CR teachers (58.8%), $F(2, 113) = 11.97$, $p < .001$, $\eta^2 = .18$. Finally, there were significant differences between all three course groups in terms of how well teachers thought courses supported an understanding of the global world, with honors teachers (87%) suggesting more support than general studies teachers (63.2%) who suggested more support than CR teachers (25.8%), $F(2, 108) = 13.42$, $p < .001$, $\eta^2 = .199$. Given a CR format geared toward independent study, it is not surprising CR teachers reported less course support for group collaboration. Reports of less course support for civic literacy and an understanding of the global world in CR courses could be related to the lack of context and authentic problems being used in modular lessons.

Since advocacy for an educational program often stems from student success, students and teachers were asked if they would recommend more students take online courses from the virtual school. Seventy-eight percent of CR students agreed or strongly agreed, which was significantly more than either general studies (66.7%) or honors (68.6%) students, $F(2, 783) = 5.84$, $p < .05$, $\eta^2 = .016$. Eighty-six percent of CR teachers agreed, which was similar to general studies (72.6%) but significantly lower than honors teachers (95.7%), $F(2, 111) = 5.18$, $p < .05$, $\eta^2 = .085$.

Barriers to Credit Recovery Students' Learning

Students were asked to report how frequently they used nine different computer and Internet resources outside their home to access their online class (see Table 3). While the percentage of students who reported using non-home resources was typically below 20%, significantly more CR students relied on non-home computers and Internet access than students in general studies and honors courses across all nine categories of support (e.g., before-school lab, during school lab, after school lab, in-school library, town library, etc.). These findings suggest there may be a small subpopulation of CR students who rely on additional resources to take online courses. While technology access is one potential barrier, technology skill is another. CR teachers were significantly less likely to agree or strongly agree their students were technically prepared to be successful in their online courses (43.8%) compared to honors teachers (73.9%), $F(2, 112) = 4.67$, $p < .05$, $\eta^2 = .077$.

Table 3

Main Effects of Student Course Groups for Questions About the Frequency
of Non-Home Computer and Internet Access

Survey Items	df	F	p	η2	Means (SD) % somewhat frequent/very frequent		
					Credit Recovery	General Studies	Honors
Frequency of use: before school computer lab.	2, 607	7.01	< .05	.023	2.28_a (1.18) 15.7%	1.81_b (1.13) 9.6%	1.97_b (1.25) 14.6%
Frequency of use: during school computer lab.	2, 609	9.57	< .001	.030	2.70_a (1.38) 34.8%	2.08_b (1.29) 20.1%	2.26_b (1.38) 22.9%
Frequency of use: after school computer lab.	2, 609	10.06	< .001	.032	2.51_a (1.33) 26.9%	1.92_b (1.22) 13.1%	2.17_b (1.34) 20.7%
Frequency of use: in-school library/ media center computers or resources.	2, 611	8.75	< .001	.028	2.65_a (1.36) 33.1%	2.08_b (1.29) 19.2%	2.25_b (1.32) 21.6%
Frequency of use: town library computers or resources.	2, 619	12.87	< .001	.040	2.56_a (1.34) 26.3%	1.91_b (1.19) 13.3%	2.15_b (1.27) 18.7%
Frequency of use: local business with wireless Internet (e.g., coffee shop, bookstore).	2, 612	5.51	< .05	.018	2.54_a (1.31) 27.6%	2.13_b (1.27) 18.5%	2.13_b (1.26) 16.8%
Frequency of use: civic organization providing access to computers or Internet after school (e.g., boys/ girls club)	2, 606	10.45	< .001	.033	2.28_a (1.29) 20.1%	1.74_b (1.05) 7.2%	1.86_b (1.11) 8.7%
Frequency of use: community college computers or resources.	2, 610	6.39	< .05	.021	2.19_a (1.27) 17.2%	1.76_b (1.11) 9.0%	1.89_b (1.14) 11.1%
Frequency of use: university computers or resources.	2, 610	4.82	< .05	.016	2.23_a (1.26) 17.9%	1.85_b (1.16) 10.7%	1.92_b (1.16) 10.2%

Means with the same letter in the subscripts do not significantly differ from one another at the .05 level according to REGWQ tests.

Teachers were asked one open-ended question about issues or barriers that limit students' use of online courses. Responses were varied, but included the following: lack of necessary technology skills among students working primarily from home (n=4) paired with unskilled parents and/or unavailable advisors (n=3), limited or poor technology access (n=2) and technical problems (n=1), over-confidence and enrolling in too many summer courses instead of focusing on successfully completing just one (n=2), lack of self-discipline to take a self-directed online course (n=3), and lack of prerequisite skills for a given course (n=2).

A few teachers recommended better screening of students to ensure one or more of these barriers did not overwhelm them, although significantly more CR students agreed or strongly agreed that a school-based distance learning advisor led a face-to-face orientation to explain the requirements and expectations for online courses (61.2%) than either general studies (40.4%) or honors (51.0%) students, F(2, 639) = 9.34, p < .001, η2 = .028. Also, significantly more CR students also agreed or strongly agreed that they were required to report to an advisor on a regular basis to discuss progress in their online course (46.5%) than either general studies (30.1%) or honors (28.1%) students, $F(2, 634) = 11.86$, $p < .001$, $\eta^2 = .036$.

Teaching and Course Design

CR students were generally pleased with the teaching of their online courses. When asked if their teacher did a good job teaching in the online environment, 93.7% of CR students agreed or strongly agreed which was significantly higher than either general studies (82.9%) or honors (83.6%) students, $F(2, 697) = 8.67$, $p < .001$, $\eta^2 = .024$. CR students also reported significantly higher use of three strategies by their teachers that one would typically associate with a CR course--providing regular feedback, providing for differentiation, and recommending strategies to succeed in the course (see Table 4).

Perhaps owing to the virtual school's CR model that emphasizes self-pacing through modular units, CR teachers reported significantly less frequent use of formal collaborative/cooperative assignments, less frequent encouraging of students to communicate with peers in formal groups, and less frequent assigning of hands-on or authentic projects compared to teachers of general studies and honors courses (see Table 5). CR teachers were also significantly less likely to agree or strongly agree that their professional development from the virtual school was helping them understand ways to encourage group collaboration (e.g., peer groups, group projects, discussion boards, wikis, Web conferencing, etc.) (61.3%) compared to either general studies (78.9%) or honors (95.7%) teachers, $F(2, 108) = 6.02$, $p < .05$, $\eta^2 = .100$.

Table 4

Main Effects of Student Course Groups for Questions Associated with Teacher Actions

Survey Items	df	F	p	η^2	Means (SD) % agree/strongly agree		
					Credit Recovery	General Studies	Honors
My teacher provides timely and regular feedback on course assignments, assessments, and my progress.	2, 696	4.94	< .05	.014	4.29$_a$ (.84) 89.3%	4.00$_b$ (.97) 81.3%	4.08$_b$ (.99) 81.1%
My teacher provides content and assignments that address students' different levels of understanding.	2, 665	10.99	< .001	.032	4.15$_a$ (.91) 80.8%	3.69$_b$ (1.06) 64.4%	3.86$_b$ (.98) 70.4%
My teacher provides or suggests strategies to help students succeed in this course.	2, 690	11.25	< .001	.032	4.34$_a$ (.83) 90.5%	3.92$_b$ (.97) 78.1%	4.07$_b$ (.91) 81.1%

Means with the same letter in the subscripts do not significantly differ from one another at the .05 level according to REGWQ tests.

While all teachers in this virtual school work with course shells they can modify with added examples and activities, CR teachers reported a significantly smaller percentage of their time was spent on added roles such as "designer" and "technologist" compared to general studies and honors teachers (see Table 6). CR teachers were also significantly less likely to agree or strongly agree that they were using 21st century tools such as wikis, blogs, and podcasts in their courses (58.1%), compared to general studies (89.7%) and honors (95.0%) teachers, $F(2, 106) = 10.71$, $p < .001$, $\eta2 = .188$.

Table 5
Main Effects of Teacher Course Groups for Questions Associated with Teaching Activities
Employed in Course

Survey Items	df	F	p	η2	Means (SD) % somewhat frequently/very frequently		
					Credit Recovery	General Studies	Honors
Assign formal collaborative or cooperative assignments.	2, 105	26.52	< .001	.336	2.00$_a$ (1.02) 10.0%	3.47$_b$ (1.05) 62.1%	3.90$_b$ (1.02) 75.0%
Encourage students in the class to communicate with one another (e.g., study groups).	2, 106	17.59	< .001	.249	2.42$_a$ (1.09) 12.9%	3.81$_b$ (1.03) 74.1%	3.70$_b$ (1.22) 65.0%
Assign hands-on or authentic projects (e.g., writing, blogs, webquests).	2, 104	23.77	< .001	.299	2.66$_a$ (1.40) 37.9%	3.93$_b$ (.93) 81.0%	4.50$_b$ (.61) 95.0%

Means with the same letter in the subscripts do not significantly differ from one another at the .05 level according to REGWQ tests.

Table 6
Main Effects of Teacher Course Groups for Questions Associated with Percent of Time
Spent on Different Planning Activities

Survey Items	df	F	p	η²	Mean Percent of Time (SD)		
					Credit Recovery	General Studies	Honors
Percent of time spent on role of "technologist," or making or helping make technological choices to improve the environment available to learners.	2, 106	6.08	< .05	.103	3.9%$_a$ (3.72)	6.6%$_b$ (4.35)	7.9%$_b$ (5.1)
Percent of time spent on role of "designer," or de-signing worthwhile online learning tasks.	2, 106	4.51	< .05	.078	3.77%$_a$ (6.80)	7.71%$_b$ (5.46)	7.75%$_b$ (7.15)

Means with the same letter in the subscripts do not significantly differ from one another at the .05 level according to REGWQ tests.

Table 7

Percentage of Students and Teachers Who Agreed or Strongly Agreed Students Would be More Successful Given Different Strategies Recommended for Credit Recovery Courses

Credit Recovery Strategies	Students	Teachers
1. Teacher closely monitors students' performance to let them know how they can be successful.	75.1%	100.0%
2. Course allows students to move through material at their own pace.	76.2%	97.1%
3. Course is subdivided into learning objects or short lessons that can be mastered in steps before moving on to the next item.	76.3%	94.1%
4. Course allows students to test out of material they already know and move on to the next topic.	64.2%	100.0%
4. Course lessons are followed by an assessment exercise to determine if students understand the material or need extra assistance.	75.4%	88.2%
6. Teacher helps students set goals to pace themselves through course.	70.5%	88.6%
7. Course includes more synchronous opportunities to discuss content with other students and the instructor.	62.6%	85.7%
8. Course includes study aids like graphic organizers and study sheets.	66.5%	80.0%
9. Course includes less text and more audio-visual components to help explain course content.	61.6%	76.5%
10. Course lessons are preceded by a diagnostic exercise to determine if students may need extra tutoring.	53.8%	81.8%
11. Course is supported by evening lab hours when students can access a computer.	47.5%	76.7%
12. Course is preceded by a pre-test to determine if students have necessary prior knowledge.	53.0%	57.1%
13. Course includes a combination of online and onsite instruction with a tutor in a lab.	36.8%	56.3%
14. Course includes a combination of online and onsite instruction with a teacher in a classroom.	42.1%	45.5%
15. Advanced students are made available to tutor credit recovery students at their school.	33.2%	48.3%
16. Course isn't a credit recovery online course, but a regular online course with extra help for students who need it.	40.8%	6.7%
17. Course is primarily face-to-face with expanded lab time to work on assignments with an available tutor.	28.5%	0.0%

CR students and teachers were asked if they agreed students would be more successful if their course included different strategies recommended for CR courses. Strategies are listed in Table 7 and have been sorted by popularity among survey respondents. Two of the top six strategies involve the

teacher monitoring student performance and helping the student set course goals. Four of the top six strategies involve modular course designs that allow students to self-pace through short lessons and take assessments to determine if they can opt out of or need to redo given lessons. The least popular strategies involve some aspect of on-site instruction as a supplement to the online course, such as tutors in labs, peer tutors at school sites, and hybrid/face-to-face course alternatives. With the exception of strategies 8, 12, and 14, significantly more teachers than students agreed with the usefulness of strategies.

DISCUSSION

The idea of at-risk learners taking courses in unstructured online environments appears contradictory. Both school leaders and researchers have voiced concerns over at-risk students prone to low motivation and limited self-directedness learning online with many potential distractions (e.g., games, videos, social media) (Humphrey, 2006; Ingerham, 2012; Oliver et al., 2009; Picciano & Seaman, 2010). Fast-moving CR courses scheduled in abbreviated summer sessions may place even more demands on students' time management skills (Donahue Institute, 2012). Some research validates these concerns, with CR students in one study observed using Web sites outside of their course (e.g., YouTube), and engaging in idle, off-task behaviors (Ingerham, 2012). Alternatively, some research negates these concerns with at-risk students reporting they learned "self-direction, time management, computer skills, and research skills" in their online courses (Ferdig, 2010, p. 16).

The effectiveness or ineffectiveness of CR courses is tied to numerous factors. Evidence from the present study suggests there are certain advantages to learning online that help CR students address issues associated with prior failure, and that connected, responsive teaching may help as well. Challenges remain, however, with integrating collaborative, higher-level activities into CR courses without undermining program flexibility.

Advantages of Learning Online

In the present study the structure of time-flexible, independent, and focused summer CR courses helped learners address reported self-directedness issues. CR helped students by increasing the flexibility of time: the ability to work any time without attendance concerns, at one's own pace with reduced stress, until work was mastered with review of material and revision of assignments, and work on only pertinent material with the ability to test out of known content. Watson and Gemin (2008) note that

flexible programs can be motivating for CR learners. Online CR also helped our students by removing peer distractions they had experienced in face-to-face classrooms, although prior research has suggested even lab-based CR can remove peer distractions if students are asked to wear headphones and concentrate on their course (Trautman & Lawrence, 2004). Summer-based CR helped our students by removing the distraction of managing multiple courses. Likewise, the Donahue Institute (2012) found CR students were more likely to complete a course when they only took one compared to two, three, or four, confirming our students' beliefs that trying to manage multiple courses could be a distraction that impacts progress.

When comparing their learning in face-to-face and online settings, significantly more CR students reported learning "a little more" or "much more" in the online setting (62.4%) than did general studies or honors students. CR teachers, however, were far less likely to report their students were learning "a little more" or "much more" in the online setting (16.1%). This discrepancy could be explained by the low response rate among our CR students, with the student percentage perhaps reflective of higher achieving CR students motivated enough to respond to our survey, and the teacher percentage reflective of the CR students at large, including those who were not faring so well in the online setting. However, since 77% of CR teachers did report students were succeeding in online courses, the students who reported learning more online compared to face-to-face could reflect a renewed optimism for learning in a setting they found substantially different from prior face-to-face environments, with more support, and where more success was being realized. Significantly more CR students recommended future students take online courses from this virtual school (78%) than students in general studies and honors courses, suggesting satisfaction with the experience. Future researchers may wish to investigate this notion of academic optimism via CR courses and the role it may play in transitioning students toward a more internal locus of control.

Connected, Responsive Teaching

Some students in this study attributed prior course failure to poor teaching, while indicating their CR teachers provided them with more individualized attention and feedback on their work. CR students reported significantly greater use of three teaching strategies in their courses compared to general studies and honors online courses: providing regular feedback, differentiating content and assignments, and recommending success strategies. Not surprisingly, significantly more CR students reported their teacher did a good job teaching in the online environment compared to general studies and honors students who rated teacher performance lower. The importance

of teacher support has been noted in other CR studies (Christian, 2002; Dessoff, 2009; Rennie Center, 2009), with some agencies stipulating additional release time for teachers to provide student support (Zegarac & Franz, 2007). Oliver et al. (2009) noted CR teachers have added pressure to actively seek out struggling students, since low-performing students might be less likely to seek out assistance on their own.

Reports from other CR programs suggest student-teacher interaction is important even when using self-pacing, pre-programmed materials, but is not necessarily the norm. Li and Edmonds (2005) reported that students learning math through computer-assisted instruction still required access to a teacher at any time to assist with comprehension. Ingerham (2012) reported CR students taking an online Algebra course in a school-based setting rarely interacted with online teachers, and lab-based teachers struggled to keep up with "30 students all working through the curriculum at their own pace" (p. 74). In this setting, students exhibited disengagement, off-task behavior, and lack of self-direction. Munger (2009) warns that drill programs like *Novanet* remove "humanistic features" and "the social aspect of learning" that "alternative students long for in an educational setting" (p. 152).

Blending face-to-face elements such as teacher lab assistance with online, drill-oriented courses, is a recommended strategy to help students feel more connected (Dessoff, 2009; Kronholz, 2012). The Donahue Institute (2012) reported that students taking CR courses at sites staffed with instructors and case managers were more likely to complete courses, and "many students cited the importance of their relationship" with these staff despite the self-directed nature of CR (p. 6). Watson and Gemin (2008) describe one alternative school in Michigan that purposely placed at-risk students in labs staffed with teachers for added structure as they "develop the independent learning skills, self-discipline, and technology-based communication skills necessary to become successful online learners" (p. 10). In the present study, online CR teachers were backed up by distance learning advisors at each face-to-face school. Findings suggest these advisors were aware of the special needs of their CR participants, since significantly more CR students reported receiving an orientation and being required to report to an advisor than either general studies or honors online students. Trautman and Lawrence (2004) describe a lab-based CR program where new students are partnered with students "already succeeding" as a way to promote a more collaborative environment and the development of social skills, despite the independent nature of the work (p. 11).

Interestingly, students and teachers in the present study rated the inclusion of face-to-face components among the least popular of CR options, perhaps owing to the summer timeframe of the study, or perhaps owing to the desire for learning at any time, pace, and place. However, more than two

thirds of CR students and teachers did agree or strongly agree that synchronous opportunities to discuss content with the instructor and other students would support student success, so perhaps a compromise position might involve the use of online conferencing tools to provide real-time opportunities for communication and collaborative projects while still meeting participant preferences for learning online. Lawrence and Routten (2009) caution against credit recovery programs with "little student engagement and teacher interaction" and recommend developers follow the online course standards published by SREB (2006) (p. 20).

Finally, in addition to synchronous lab-based or online teacher support, research suggests there is a role for pre-programmed, asynchronous scaffolds as well that provide for technical orientation/instruction or that promote recommended learning strategies. Such scaffolds may be part of a standard organizational course design, or individual instructors may insert them as needed. In the present study, significantly fewer CR teachers compared to honors teachers reported that their students were technically prepared for the online course, suggesting a need for technical supports. Humphrey (2006) reports that planned interventions/tutorials to help the at-risk set goals, plan their time, and adopt effective learning strategies, had a positive impact on learner behaviors.

Curricular Conundrum

Online CR programs and technology used by at-risk students commonly emphasize basic skill remediation, drill-and-practice, and lower levels of content application practiced in relative isolation (Brown, 2001; Christian, 2002; Kim & Taylor, 2008; Li & Edmonds, 2005; Munger, 2009). The apparent shortcomings in self- and drill-only programs has led some to refer to CR as "factories ... opened to boost graduation rates ahead of state and federal sanctions" (Kronholz, 2012, p. 26). While independent study of basic skills has its place, many researchers question, should we be teaching more in CR? Li and Edmonds (2005) rehash the debate over which technology-supported instructional strategies are best for struggling learners, with some designers promoting drill-and-practice, others higher-level thinking skills, and others a combination of basic skills that bridge to problems. Kim and Taylor (2008) question if drill-oriented, credit recovery programs really serve students' best interests and help to "break the cycle of educational inequality," when they systematically fail to provide a more rigorous curriculum supportive of higher-level, critical thinking (p. 207). The challenge of course is how to integrate higher-level group projects and collaborations into programs that allow students to test out of material and move at different paces, when those flexible program elements are desired by learners and seemingly effective.

In the present study, we encountered some conflicting data about course curricula. Surprisingly, more CR students reported that their courses were supporting 21st century skills than other course groups, particularly building technical literacy. Not surprisingly given the modular, self-paced format of CR courses, significantly fewer CR teachers reported using collaborative/cooperative assignments, student-student interactions in groups, and authentic projects. They reported receiving less professional development to help them understand how to promote collaboration. They reported significantly less time spent in the teaching roles of "designer" and "technologist," suggesting they were not modifying pre-programmed, modular materials. And they reported significantly less use of 21st century tools (e.g., wikis, blogs) than peer teachers in general studies and honors courses. Given the less frequent use of collaborative, interactive elements in CR courses, we did not expect CR students to report their courses were supporting more 21st century skills. We suspect CR students unfamiliar with online learning may have over-valued course quality with positive impressions of multimedia elements and content interactivity, while teachers were more realistic that courses could be improved with added collaborations and perhaps higher-level work breaking from the drill mode of CR courses.

IMPLICATIONS FOR PRACTICE AND RESEARCH

The online CR courses offered by this virtual school helped students overcome both internal self-discipline and time-related issues as well as external teaching issues cited as primary reasons for their failure of prior face-to-face courses. Both CR students and teachers reported student success in their online courses, with this success breeding both optimism and advocacy for the program among student participants. Study data and related research suggest the following implications for CR practice and research.

Certain implications for CR practice are clear and should be implemented. For example, CR students will benefit from pre-course screening to keep them from taking on too many courses that can be a distraction (one is ideal), and to ensure they have adequate technical skills to work in online environments with remedial training provided as needed. In addition, teacher support should be planned for as part of CR programs, as placing at-risk students in front of a computer with no monitoring or support is a recipe for failure. CR students appreciate and benefit from connected, responsive teaching that includes regular feedback, differentiated content and assignments, and recommended success strategies such as goal-setting and time management.

Other implications for practice are less clear and will require give-and-take decision-making by program planners, with the potential to inform these decisions with new research. For one, we know that time-flexible CR courses are forgiving and help students with self-direction issues to manage course material (e.g., working at any time, at own pace, repeat until mastered, test out of known material), but this drill-type course structure is seemingly at odds with calls for higher-level projects and peer collaborations that typically require tighter scheduling. Future research should investigate how and to what extent CR course designs can incorporate higher-level work without sacrificing the advantages of time flexibility.

Also, we know that independent CR removes peer distractions reported by students in face-to-face settings, so if we roll more social interaction and collaborative knowledge construction back into CR courses does this undermine the value of focus in independent work? Future research should investigate how and to what extent CR course designs can incorporate peer-to-peer work without sacrificing the advantage of focus and the development of personal skills.

Finally, the two most common modes of CR instruction (face-to-face in lab, fully online) each present both opportunities and challenges to address. Blended CR programs with teachers in school computer labs have the advantage of on-demand help if the number of students is not too high for the teacher to manage, plus opportunities to group students for collaborative work or peer tutoring. However, the lab-based mode limits potential advantages to learning any time, any place. Fully online CR programs with virtual teachers available from a distance may be preferred by students in the summer, but may present a disadvantage if students cannot get immediate help when needed; furthermore, this could be an issue if dispersed students cannot be grouped for collaborative work. Synchronous conferencing tools can be leveraged in support of student-teacher and student-student socialization when the fully online mode is desirable. Future research should investigate appropriate structures for CR courses to help program planners understand minimal/ideal thresholds of teacher support and promising instructional strategies.

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