Using Digital, Adaptive Mathematics Programs for Credit Recovery

Guidance for Idaho Middle Schools and High Schools

INTRODUCTION AND BACKGROUND

Historically in Idaho, high school credits have been earned through a process of completing 60-hours of seat-time in a course. The **Idaho Content Standards** "describe the knowledge, concepts, and skills that students are expected to acquire at each grade level in each content area." IDAPA 08.02.03.007 Idaho code allows for both seat-time and mastery options: 08.02.03.105.a. & b.

> ***a. High school credit.*** *Credits. (Effective for all students who enter the ninth grade in the fall of 2010 or later.) One (1) credit shall equal sixty (60) hours of total instruction.*
>
> ***b. Mastery.*** *Notwithstanding the credit definition of Subsection 105.01.a., a student may also achieve credits by demonstrating mastery of a subject's content standards as defined and approved by the local school district or LEA.*

Additionally, statute guidance in *Idaho State 33-1632* includes the statute-based definition of mastery:

> *"Mastery-based education" means an education system where student progress is based on a student's demonstration of mastery of competencies and content, not seat time or the age or grade level of the student."*

For additional guidance on how to assign credit using a mastery-based system, see this Determining Mastery Summary.

CREDIT RECOVERY

The term *credit recovery* is referenced in IDAPA 08.02.03.107 in reference to implementing a middle school credit system

> *"A school district or LEA must implement a credit system no later than grade seven (7) that includes components that address the credit requirements, credit recovery, alternate mechanisms and attendance. The local school district or LEA may establish credit requirements beyond the state minimum."*

Additionally, the term is often used in Idaho high schools to refer to courses or programs that are used for students who have failed a high school course to "recover" their credits. Some credit recovery programs at the high school level are utilizing the mastery option for awarding credit rather than the 60 hours of instruction. It is important that a district has established clear policy and procedures for how students can recover credits after failing courses at both the middle school and high school levels. In Idaho, each school district determines what content is equivalent to one credit and sets their own credit recovery policy. A credit recovery course must meet the content standards of the original course.

Online curriculum is often used by many districts as a part of a credit recovery course or program. A digital, adaptive mathematics program is one type of online curriculum that can be used for this purpose.

CONSIDERATIONS FOR DISTRICTS

- Most digital, adaptive mathematics programs are not designed to be a stand-alone online course. They are designed to supplement high-quality classroom instruction from a qualified mathematics teacher.
- While classified personnel and educators who are not math certified teachers can assist with student management in a technology system, instructional oversight and decisions about intervention should be made by a qualified secondary math certified teacher who is the teacher of record.
- If a digital, adaptive mathematics program is being utilized as supplemental math curriculum for a math course where credit is awarded based on 60 hours of instruction, the teacher of record must hold a math endorsement and be highly qualified in order to grant graduation credit for the course.
- If a digital, adaptive mathematics program is being utilized to award credit based on demonstration of mastery, a qualified secondary mathematics teacher should evaluate student evidence of mastery of course content to determine if credit has been earned.
- When students fail a course, sometimes they have mastered some of the course content while having gaps in learning for other concepts. A digital, adaptive mathematics program can be a valuable and reliable tool to assess a student's progress in Algebra and Geometry content and identify areas of mastery as well as areas of missed learning. It is also a helpful tool to review prior learning. However, this may not be the appropriate tool for students who never learned course content or who may need intensive intervention in a small group setting. Some students may have great success with a digital, adaptive curriculum, while others may need a different option to recover mathematics credits. It is important that a qualified secondary mathematics teacher is tracking student progress in the system and making appropriate adjustments frequently as students work in the system. Regular coaching conferences with students or small groups of students are a good strategy for monitoring student progress.
- How districts convert mastery demonstrated through work in a digital, adaptive mathematics program to course grades is determined by the local district's credit recovery policy and procedures.

BEST PRACTICES

Although the educational research on this topic is limited, a growing body of research suggests that using computer-assisted instruction (CAI) in mathematics has a positive effect on student math achievement (see references below). This same body of research provides guidance on best practices for utilizing an online, adaptive program to support mathematics instruction.

- CAI is most effective in combination with high quality core instruction that includes inquiry, experience and discovery rather than as a replacement for core instruction.
- The effect of computer assisted instruction is maximized when students are given frequent opportunities to respond and are provided with immediate feedback.
- Students' work with CAI should not be in isolation.
- Students need opportunities to collaborate and communicate about the mathematics they are learning through CAI
- Tasks and problems encountered in CAI can be used to facilitate rich small group or whole class problem solving discussions.
- Data from CAI should be used to make instructional decisions for a student, not to track students into leveled classes.
- CAI in mathematics should be a part of a carefully planned sequence of learning experiences that promote conceptual understanding.

ADDITIONAL INFORMATION

For further information or support please contact:
Dr. Catherine Beals, Mathematics Coordinator; cbeals@sde.idaho.gov (208) 332-6932

For additional information on high school graduation requirements in mathematics, please see IDAPA 08.02.03.105 d

REFERENCES

Li, Q., Ma, X. (2011). A meta-analysis of the effects of computer technology on school students' mathematics learning. Educational Psychology Review, 22, 215–243.

Burns, Matthew K. (2012). "Effect of a Computer-Delivered Math Fact Intervention as a Supplemental Intervention for Math in Third and Fourth Grades". Remedial and special education (0741-9325), 33 (3), p. 184.

Cheung, A. C. K., Slavin, R. E. (2013). The effectiveness of educational technology applications for enhancing mathematics achievement in K-12 classrooms: A meta-analysis. Educational Research Review, 9, 88–113.

Hawkins, Renee O., Collins, Tai, Hernan, Colleen, Flowers, Emily. (2017). Using Computer-Assisted Instruction to Build Math Fact Fluency: An Implementation Guide. Intervention in School and Clinic, v52 n3 p141-147

Rich, S.E.H., Duhon, G.J. & Reynolds, J. (2017) Improving the Generalization of Computer-Based Math Fluency Building Through the Use of Sufficient Stimulus Exemplars. J Behav Educ 26, 123–136.

Champion, Joe. (2018). Statistical Report of Idaho Students' Mathematics Achievement by Participation in State-Sponsored Imagine Math™ Curriculum, 2016-2017 [Report submitted to the Idaho State Department of Education] Boise, ID.

NCTM. (2015). *Strategic Use of Technology in Teaching and Learning Mathematics* [Position Statement]. Retrieved from: https://www.nctm.org/uploadedFiles/Standards_and_Positions/Position_Statements/Strategic%20Use%20of%20Technology%20July%202015.pdf

Dick, T. P., & Hollebrands, K. F. (2011). Focus in high school mathematics: Technology to support reasoning and sense making. Reston, VA: NCTM.

NCSM. (2020). *Closing the Opportunity Gap: A Call for Detracking Mathematics* [Position Statement]. Retrieved from: https://www.mathedleadership.org/docs/resources/positionpapers/NCSMPositionPaper19.pdf