

Exact Path with Standards Mastery: A Report for Tiered Evidence for ESSA and Logic Model

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Introduction

Program Description

Exact Path with Standards Mastery is a supplemental instructional program created by Edmentum, which combines the features of two research-based products: Study Island and Exact Path. Study Island is a standards-based mastery platform that features customizable test practice questions aligned to state standards. Exact Path is an adaptive learning program that uses a computer-adaptive test (Exact Path Diagnostic) to place learners into a personalized learning path that consists of instructional modules, practice problems, and quizzes. NWEA MAP and Renaissance Star scores can also be used for placement into the learning path in lieu of the Exact Path diagnostic. Research on these products individually has found positive and significant effects on student growth for both Study Island (Randel, 2019b, 2019c) as well as Exact Path (Randel, 2018b, 2018a, 2019a). When using Exact Path with Standards Mastery, which includes key features of Study Island, on the same platform, educators and learners are provided access to both individualized instruction on critical skills and standards-aligned formative testing.

Figure 1 displays the Logic Model associated with Exact Path with Standards Mastery, which articulates specific resources, strategies, and short- and long-term outcomes for its implementation.

Figure 1

A Logic Model for Exact Path with Standards Mastery

RESOURCES (INPUTS)	STRATEGIES & ACTIVITIES (OUTPUTS)	PROGRAM OUTCOMES	
		SHORT-TERM	LONG-TERM
<p>TEACHERS</p> <ul style="list-style-type: none"> Teacher-led instruction that occurs outside of Exact Path with Standards Mastery platform (whole class or small group) Clear Exact Path with Standards Mastery implementation guidance, training, and support Exact Path instructional resources <p>STUDENTS</p> <ul style="list-style-type: none"> Standards-based 10-item formative assessment "Just-in-time" teacher reteach or small group instruction 	<ul style="list-style-type: none"> Administers Standards Mastery assessment, reviews data, and responds with instruction. Splits instructional time between remediation and on-grade standards Assign Standards Mastery assessment, based on on-level whole-class instruction according to scope and sequence 	<ul style="list-style-type: none"> Spends less time researching instructional resources Individualized learning runs in the background without having to monitor for each student. 	<ul style="list-style-type: none"> Positive attitudes towards Standards Mastery Increased awareness of individual student performance, both for on-grade standards and for gaps in prerequisite skills
	<ul style="list-style-type: none"> Participate in standards-based practice Learning path Exact Path skills/modules 	<ul style="list-style-type: none"> Spend more time on task (defined as use of the platform). Students score higher on interim assessments (Exact Path diagnostic, NWEA MAP, and Renaissance Star). Stronger mastery and retention of grade-level standards 	<ul style="list-style-type: none"> Students score higher on state summative assessments.

Literature Review

Methodology

Researchers in the Center for Research and Reform in Education (CRRE) identified applicable sources for the literature review and the tiered evidence using a systematic review process that included (1) the identification of main topics and themes used in Exact Path with Standards Mastery (namely, adaptive learning), (2) a general search of extant literature associated with the main topic, (3) a screening for inclusion based on relevance, and (4) an evaluation of the quality of the identified sources. If a study met the criteria, it was included in the tiered evidence; specific studies are described further in the literature review as they demonstrate support for the instructional approach used by Exact Path with Standards Mastery.

Adaptive Learning and Instruction

The New Media Consortium (NMC) declared adaptive learning an emerging tool in the 2004 New Horizon Report. And though it is not a recent development, adaptive learning has been especially successful in areas where younger learners typically struggle. Intelligent learning systems can provide a personalized approach to instruction through learner preferences, cognitive ability, and the learning data that accrues from interaction with the system. Fengying et al. (2021) breaks adaptive learning into two components: the self and adaptation. Included in the “self” are the supports of personalized feedback and guidance, automatic adjustments to learning behaviors, and provide information to teachers to make data-driven decisions for the learner. Likewise, the “adaptation” component refers to the individualization and independence of the learner, freedom of choice, and a constant calibration of learning content to learner ability and environment.

Prior research supports the benefits of an adaptive learning program in digital environments, particularly within the context of elementary and secondary school contexts. Al Otaiba et al. (2011) used a Response to Intervention (RtI) approach to improving literacy. This data-driven approach identifies learner strengths and weaknesses, which inform the amount and type of instructional guidance provided. Similarly, Gersten et al. (2009) provides recommendations for implementing early interventions such as the RtI approach, including but not limited to providing explicit and systematic instruction for individual learners, incorporating visual representations of math problems, including motivational strategies, and constant monitoring of learner progress. Neitzel et al. (2022) supports the view that adaptive programs that provide one-to-one interventions can have significant positive outcomes for learners, and meta-analyses that review experimental studies on the outcomes of individualized tutoring programs routinely affirm their positive effects, especially within the early grades and secondary learning environments (Pellegrini et al., 2021; Therrien, 2004).

Research on adaptive learning in the postsecondary context also is strongly positive. A study by Eau et al. (2022) tested the effectiveness of an adaptive learning courseware program that based its algorithmic learning data on a diagnostic test at the beginning of the semester. The

study observed students (N = 356) in a large university, but the research design is especially unique because it measured the effectiveness of the adaptive learning program while controlling for pre-existing knowledge, which was determined by the pretest. The findings indicated that the adaptive learning tool generally improved measures of achievement but benefitted higher-performing students the most. The authors contend that the adaptive learning tool might help learners with lower self-efficacy in some areas, such as math. They concluded that the tool “might help raise their self-efficacy by focusing on formative assessments” (p.1103) - a key feature of the Exact Path with Standards Mastery program.

Figure 2 provides the tiered evidence for each of the strategies specified by the Logic Model.

Figure 2*Tiered Evidence for Each Strategy*

Strategy (from Logic Model)	Strategy	Evidence-Base	Rating
Administers Standards Mastery assessment, reviews data, and responds with instruction.	Data-driven decision making	(Al Otaiba et al., 2011; Connor et al., 2011, 2013; Hamilton et al., 2009)	Tier 3 – Promising Evidence
Administers Standards Mastery assessment, reviews data, and responds with instruction.	Screen all students for risk of difficulties	(Gersten, Beckmann, et al., 2009; Gersten, Compton, et al., 2009; Gersten et al., 2007)	Tier 3 – Promising Evidence
Administers Standards Mastery assessment, reviews data, and responds with instruction.	Progress monitoring of students (general population and those at-risk)	(Dietrichson et al., 2017; Frye et al., 2013; Fuchs & Fuchs, 2001; Gersten, Beckmann, et al., 2009; Gersten, Compton, et al., 2009; Gersten et al., 2007)	Tier 3 – Promising Evidence
Splits instructional time between remediation and on-grade standards	Explicit and systematic instruction during intervention	(Daly et al., 2007; Gersten, Beckmann, et al., 2009; Gersten, Compton, et al., 2009; Kirschner et al., 2006; Snow et al., 1998)	Tier 1 – Strong Evidence
Splits instructional time between remediation and on-grade standards	Intensive small group or individual instruction/intervention for those students at risk/performing below grade level	(Gersten, Compton, et al., 2009; Gersten et al., 2007; Kamil et al., 2008; Neitzel et al., 2022; Pellegrini et al., 2021)	Tier 1 – Strong Evidence
Participate in standards-based practice	Daily practice of arithmetic facts	(Daly et al., 2007; Gersten, Beckmann, et al., 2009; Imbo & Vandierendonck, 2008)	Tier 3 – Promising Evidence
Learning path XP skills/modules	Daily reading of connected text.	(Ardoin et al., 2016; Foorman et al., 2016; Therrien WJ, 2004)	Tier 2 – Moderate Evidence
Learning path XP skills/modules	Differentiated instruction at appropriate student level	(Daly et al., 2007; Gersten, Compton, et al., 2009; Shanahan et al., 2010)	Tier 3 – Promising Evidence

Conclusion

Taken together, there is extensive support that adaptive learning-based instructional interventions such as those similar to the Exact Path with Standards Mastery Program – when implemented properly and with fidelity – yield wide-ranging evidence for learning effectiveness. As described above in Figure 2, the diverse strategies articulated in the logic model are well-supported by previous research, giving the Exact Path with Standards Mastery a high likelihood for success.

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