



Indicator: Instructional teams and teachers use fine-grained data to design for each student a learning path tailored to that student's prior learning, personal interests, and aspirations. (5116)

Explanation: The most effective way to customize individual students' learning paths is through data-based decision-making. Evaluating student performance data allows teachers to adjust not only the instructional methods they use, but the contexts in which those methods are used. Achievement increases motivation, and motivation appears to improve achievement; data-based decision-making that takes both into account is the most successful approach to creating personalized learning paths.

Questions: Why should teachers use data-based decisions in customizing student learning paths? How should teachers approach data-based decision-making?

Why should data-based decisions be made in customizing student learning paths?

Data-based decision-making can result in improvements in student achievement (Campbell & Levin, 2009; Carlson, Borman & Robinson, 2011, Cawelti & Protheroe, 2001; Lai, M.K., McNaughton, S., Amituanai-Tolosa, M., Turner, R., & Hsiao, S. 2009). Data-based decision-making focuses on ongoing monitoring of student outcomes to provide an evidence base for continued use of an intervention. (VanDerHeyden & Harvey, 2013). At the core of data-based decision-making is the premise that successful learning can be measured in increments that then can be examined by teachers and other professionals to determine whether the supports they provided improved learning (Deno & Mirkin, 1977). Further, improvements in student achievement that can be produced by data-based decisions have been shown to increase student motivation for academic tasks (Eliot & Harackiewicz, 1994).

Data-based decision-making is robust and has thrived for decades in schools where teachers want to understand and accelerate instructional effects on student learning (Marston, 1989). The data that are collected in the course of daily instructional practice can be examined to evaluate the impact of different practices and interventions on student performance. The data that are generated allow teachers to customize individual learners' curriculum paths, personalizing their learning experience. A variety of personalization techniques may be included, such as targeted scaffolding (based on a student's prior knowledge), the inclusion of topics of interest to individual learners (including those in which interest has been generated due to teaching students to ask questions) and the setting of individual student learning goals based on their personal aspirations.

With the rise of technology and learning systems, the access to data and to massive amounts of data becomes more feasible for teachers. Many systems now exist which can provide teachers information about their individual students. These data systems "provide teachers with information on which students are struggling and what they are struggling on. This enables teachers to identify what material these students need support with, so that the teacher can provide them with extra assistance" (Schofield, 1995 in Baker, 2013). However, there is no substitute for the personal relationship the teacher has with each of his students in recognizing on a day to day basis what the student

is “getting” by the look on his face, his engagement, and his efforts in staying the course on assignments. Instructional teams meeting together on a regular basis can also review their unit assessments, whether pre-tests or post-tests to determine the needs of the students in their classes. All of this data is available at the teachers’ fingertips or in front of their noses and provides valuable information on a student’s progress. Knowing a student—socially and academically—clues the teacher in on the student’s interests and goals and can assist the teacher, with the student, in setting reasonable but challenging goals including areas that might be of personal interest to the student as well as stretching the student to explore new topics and areas of interest (Redding, 2014a).

How should teachers approach data-based decision-making?

According to VanDerHeyden and Harvey (2013) the process of using data to validate and personalize students’ curriculum paths comprises four steps:

Step 1. Examine student performance data: When teachers examine performance data it gives them the opportunity to identify strategies that are working effectively, along with those that may need adjustment. Different students’ data will demonstrate different learning pattern, providing teachers with the necessary information to plan for personalizing each learner’s curriculum path.

Step 2. Implement instructional changes: Once personalization plans have been made, the teacher should proceed to modify each student’s learning path accordingly. Individual modifications will vary based on the variance in the original performance data. Teachers should customize learning paths so that students who demonstrate mastery of a subject advance further; students who are struggling should remediate. The customization may occur to the instruction itself, if it is thought not to be effective, or to the context in which the instruction is delivered, if the learner is thought not to be motivated. For example, the teacher may change the topic to one of greater interest to a learner or may use the Question Formulation Technique (Rothstein & Santana, 2011) to generate learner interest in new topics.

Step 3. Evaluate and troubleshoot intervention effects: Monitoring student data shows whether or not learning progress is being made adequately. If it is not, the

teacher must assess whether or not the instructional method itself was implemented properly. This may involve the assistance of a colleague who has expertise in the method and can offer feedback and recommendations to the teacher.

Step 4. Review subsequent student performance data to evaluate improvement.

These four steps should be repeated on an ongoing basis to ensure that data-based decision-making is an integral part of daily classroom practice.

References and resources

- Campbell, C., & Levin, B. (2009). Using data to support educational improvement. *Educational Assessment, Evaluation and Accountability*, 21(1), 47–65
- Carlson, D., Borman, G., & Robinson, M. (2011). A multistate district-level cluster randomized trial of the impact of data-driven reform on reading and mathematics achievement. *Educational Evaluation and Policy Analysis*, 33(3), 378–398.
- Cawelti, G., & Protheroe, N. (2001). *High student achievement: How six school districts changed into high-performance systems*. Arlington, VA: Educational Research Service.
- Deno, S. L., & Mirkin, P. K. (1977). *Data-based program modification: A manual*. Reston, VA: Council for Exceptional Children.
- Eliot, A. J. & Harackiewicz, J. M. (1994). Goal setting, achievement orientation, and intrinsic motivation: A mediational analysis. *Journal of Personality and Social Psychology*, 66(5), 968–980.
- Lai, M. K., McNaughton, S., Amituanai-Tolosa, M., Turner, R., & Hsiao, S. (2009). Sustained acceleration of achievement in reading comprehension: The New Zealand experience. *Reading Research Quarterly*, 44(1), 30–56.
- Marston, D. B. (1989). A curriculum-based measurement approach to assessing academic performance: What it is and why do it. In M. R. Shinn (Ed.), *Curriculum-based measurement: Assessing special children* (pp. 18–78). New York, NY: Guilford.
- Redding, S. (2014a). *Personal competencies in personalized learning*. Philadelphia, PA: Center on Innovations in Learning, Temple University. Retrieved from http://www.centeril.org/publications/Personalized_Learning.pdf

- Redding, S. (2014b). *Personal competency: A framework for building students' capacity to learn*. Philadelphia, PA: Center on Innovations in Learning, Temple University. Retrieved from http://www.centeril.org/publications/Personal_Competency_Framework.pdf
- Rothstein, D., & Santana, L. (2011). *Make just one change: Teach students to ask their own questions*. Cambridge, MA: Harvard Education Press.
- VanDerHeyden, A. & Harvey, M. (2013). Using data to advance learning outcomes in schools. *Journal of Positive Behavior Interventions*, 15(4), 205–213.