What is Implementation Science? According to the National Implementation Research Network (NIRN), Implementation Science is the study of factors that influence the full and effective use of evidence-based practices. Essentially, implementation science looks at how new practices and procedures are rolled out and sustained over time. In order for evidence-based practices to be effective, they must be skillfully implemented in the way they were intended by a qualified individual. In other words, they must be implemented with fidelity. Fidelity is a cornerstone of implementation science because although a practice may be evidence-based, it will only produce changes in child outcomes if the core components (the components shown to improve child outcomes) of the practice are implemented with the consistency and intensity that the practice’s developers intended.

Implementation Science involves three steps:
1. Choosing evidence-based practices
2. Using Improvement cycles
3. Scaling up

To explain these three steps, let’s look at a problem that needs to be solved in early education: the engagement of families in their child’s school. In Indiana, 35% of low-income families reported that they were unlikely to partner with their child’s preschool and only 55% reported that they shared family information with their child’s preschool. Family engagement includes more than just the traditional school-directed activities such as family-teacher conferencing, it expands to encourage families as equal partners in supporting their child’s learning and development. So how do we address this problem? First, we decide what practice we want to implement. Choosing evidence-based practices is not easy. According to NIRN, evidence-based practices are those that have research proving their effectiveness and meet the following criteria: clear definition of the practice, clearly identified core components of the practice/program, operational definitions of the core components, and a practical assessment of the performance of practitioners who are using the practice. One evidence-based practice to address family engagement in preschool education is the Parent Teacher Home Visit Project Model (PTHVP). This practice has research showing its effectiveness on increasing child outcomes. Specifically, the model has increased communication, trust, and support between families and teachers which has in turn increased school attendance and student test scores (Sheldon & Jung, 2015). The PTHVP has 5 core components that are operationally defined (tell the teacher what to do and how). Lastly, a simple means for assessing implementation fidelity is present in the PTHVP Evaluation Toolkit to address the degree to which each provider implements the five core components of the model.

Three Basic Implementation Steps
According to the National Implementation Research Network (NIRN), Implementation Science is the study of factors that influence the full and effective use of innovations in practice. This complex science can be broken down into three steps:

1. Identification of an evidence-based practice is when an agency (local, district, regional or state) researches and decides on an evidence based strategy to address a problem they are facing.

2. Improvement Cycles occur with small groups (3-5 individuals/child care center/provider agencies/etc.) who have chosen to be part of a “trial period.” This step is where 85% of the “kinks” in implementation will be worked out so that when full implementation occurs, the practice is more fine tuned and sustainable.

3. Scaling up is when the practice is implemented as intended by at least 50% of the providers.

What are evidence-based practices and how often are they used in early childhood education?
Evidence-based practices have empirical research that supports their use in the classroom and must meet certain criteria. Research shows that although a number of evidence-based practices in early childhood have been identified, not many are implemented or implemented in the way they were intended. For example, can you think of one evidence-based practice that is used across all preschool classrooms or early intervention programs in Indiana? The answer is most likely no and this article will introduce one possible solution: Implementation Science.

Implementation Science: What's Happening?
After selecting the practice, **improvement cycles** are used to “work out the kinks”. An improvement cycle is almost like a trial run that serves as a time for practitioners to try the new practice with a small group of individuals in order to fine tune the practice. During this cyclic process, three to five groups (e.g., could be classrooms or child care centers) are chosen based on their willingness to participate. As the practice is implemented, data is gathered on how the families are responding. For the purposes of this example, let’s assume the model is being implemented at a local level (community wide). The community implementing then asks themselves what needs to be adjusted based on the data that has been collected. Once the practice has been implemented with three agencies within the community (the first improvement cycle), another improvement cycle starts with three more agencies, the data is reflected on, changes are made, and then another improvement cycle begins with three more agencies. As each group of “guinea pigs” is cycled through, more is learned about how to modify the practice to best serve all families and children. NIRN reports that following 3 to 5 improvement cycles, 85% of problems that may be present in the practice will be eliminated. So, as you move through improvement cycles and implement the PTHVP you determine what works best and what you might need to tweak. After each improvement cycle, a new group is identified and more tweaks are made to best prepare the practice for full implementation.

Once the protocol for the PTHVP is finalized through the use of improvement cycles, the last step is **scaling up**. Scaling up is the process of implementing an evidence-based practice across an entire group (not just samples of willing volunteers, which comprised your improvement cycles). For example, scaling up can occur across providers in a provider agency, at the district level, at the regional level or even at the state level. In the case of the Parent Teacher Home Visit Project, scaling up might include implementing the practice across all provider agencies within a given city or even expanding to include other neighboring communities.

Check out the next two articles to delve into specific examples that highlight the importance of each of the three steps described above. If you would like to learn more about implementation science, please visit the National Implementation Research Networks’ website.

### References


Imagine you are a program administrator and you’ve heard Katie Herron talking about the role of family engagement in improving child outcomes. Or perhaps you’ve gotten your hands on the Early Learning Advisory Committee (ELAC) Family Engagement Toolkit and recognize the need to improve your program’s family engagement practices. What do you do first?

If you are like many of us, you latch on to a practice that someone shared with you and then you bring your staff together to provide a series of workshops on how to implement the practice. After that, the expectation is that staff will faithfully carry out the new practice and nothing more needs to be done. Nice, neat, and tidy. This is how practices have been adopted at the local, regional, and state level for many years.

There is only one problem. It doesn’t work. What happens? Some staff are able to implement the practice in the way it was intended, but other staff may implement only parts of the model, or perhaps implement it incorrectly. Other staff may try to implement the model, but they may need more support or they might think they are doing it when they aren’t. Many staff may not change their behavior at all; after all, habits and routines are hard to overcome. Over time, the frequency with which the practice is carried out slowly declines until only a few staff continue to implement it. Thinking about how to re-invent family engagement practices presents an opportunity to use implementation science concepts within your own program.

Let’s look at an example.

As an early childhood program administrator, maybe you have noticed that family attendance at family-teacher conferences is quite low. To address this problem you are interested in adopting a new model of family-teacher conferencing with the goal of increasing attendance and ultimately improving child outcomes. You could use implementation science to make this happen in your program!

The first step in implementation science is to identify an evidence-based model or practice that can address family-teacher conferencing. Instead of latching onto a practice because someone told you about it or it seems logical, you decide to do a search to find a practice that has considerable research demonstrating its effectiveness for child outcomes. Examining the empirical research for effective strategies helps you to identify an evidence-based practice to implement; however, the operationalization of the practice is the key factor in successful implementation. In short, the research proves that the practice is effective, but the presence of clearly defined core components of the practice are what make it implementable. When choosing a practice you should ask yourself: What core components of the practice does that author identify? Is it easy to understand what each component means and how your staff would actually do it on a day to day basis (some practices even script what staff would do and say)? When core components are clearly identified and described, as a program director you will know exactly what to do “by the book” and what parts of the practice you can modify to better fit your program.

After considering all of the above factors, you might choose to implement the WestEd’s Academic Parent Teacher Teams (APTT) model of family-teacher conferencing. Specifically, the APTT model is an operationalized evidence-based model of family teacher conferencing that is associated with increases in student confidence, attendance, parent-teacher communication, and parent confidence (Parades, 2012).

Phew, all of that work and just the first step of implementation science is complete. This seems like a long process, doesn’t it? Implementation science is not quick and it is not easy, but the research shows it is one of the most effective ways to roll out the use of new evidence-based practices to best contribute to child outcomes.

References
Implementation Science: The Second and Third Steps

Increased federal and state accountability has led to the need for teachers and early intervention providers to make data-informed decisions, but what does that actually mean? Data-informed decisions are those that are made based on data. As early childhood professionals we know we need to make data-informed decisions but the act of actually doing so is not always clearly defined. Authentic assessment is an evidence-based strategy shown to increase student outcomes through frequent data collection later used to inform decisions regarding instruction and curriculum (Bagnato, Neisworth, & Pretti-Frontczak, 2010). Implementation science provides a platform for adopting the five core components of authentic assessment statewide in Indiana. The five core components of authentic assessment are: intentional lesson plans, focused observations, ongoing documentation (what you see and hear), review and interpretation of documentation, and use of assessment information to adjust lesson plans and information sharing with family members. Implementation science can be broken down into three steps. The first step identification of the evidence-based practice (authentic assessment, in this case) is done.

Improvement Cycling, the second step of implementation science, is the process of putting the evidence-based practice into place to ensure sustainability. In order to make this happen, individuals from all levels of early childhood systems must agree to collaborate and support implementation. Teams are formed at the state level, the regional level and the local level. These teams may include federal and state policy makers, state professional development system representatives, program administrators, and early childhood practitioners. Together, representatives of these systems must organize implementation teams in order to support, engage and enable practitioners to implement the evidence-based practice (authentic assessment) with fidelity. The most effective implementation teams are made up of individuals with a variety of perspectives. According to Fixsen, Blase, Timbers, and Wolf (2001) the use of implementation teams increases implementation success from 14% over 17 years to 80% in just three years. These teams then initiate several rounds of improvement cycling, which is the “trial period” where a small number of entities (e.g., programs, classrooms, practitioners) field test the practice in order to refine the protocol and ultimately make it sustainable for Indiana practitioners. Following the identification of those few, brave “guinea pigs” for the first improvement cycle, the practices (in this case, authentic assessment practices) would be implemented and data would be collected on how it went. Feedback loops are then used to communicate needed changes (based on the data) from local implementation teams to regional to state teams to ensure that needed adjustments are made before the next improvement cycle. As improvement cycles continue (usually it takes 3-5), capacity continues to build and kinks are worked out before the practice is scaled up state-wide.

Scaling up, the last and final step of implementation science, involves disseminating, with consistency, the practice, in this case authentic assessment, across Indiana early childhood programs. The implementation of any new practice takes time, support, resources, and communication. Since 85% of the problems that may arise in the roll out of the practice should be worked out after the completion of three to five improvement cycles, the scaling up portion of implementation should be rather smooth; however, there is still a need for ongoing professional development and coaching to ensure consistency and sustainability over time. Did you know that when coaching is provided in the classroom in addition to theory and discussion, demonstration in training, and practice and feedback, there is a 95% chance that practitioners will actually use the skill in their classroom practice? This is compared to just 5% when the coaching is removed (even if everything else is still provided) (Joyce & Showers, 2002)! Early childhood professionals should welcome and expect coaching when any new practice is rolled out to ensure fidelity and effectiveness.

The use of implementation science can contribute to the effectiveness of implementing authentic assessment or any other evidence-based practice in early childhood education. Improving the quality of early education in our state is a strong focus and implementation science should be on the tip of everyone’s tongues.

References

Did you Know?

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