

Why Is Response To Intervention (RTI) So Important That We Should Incorporate It Into Teacher Education Programs and How Can Online Learning Help?

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Abstract

The reauthorization of Individuals with Disabilities Act (IDEA) in 2004 permits the use of response to intervention (RTI) to explore whether students make adequate progress and what interventions should be provided to them. The implementation of RTI is mandated in many K-12 schools in the U.S. Thus, knowing what and how online learning can help incorporate RTI into university teacher preparation programs is necessary. This study involves examining the use of the IDEA '04 and Research for Inclusive Settings (IRIS) modules with pre-service teachers. The IRIS modules are a comprehensive online resource developed by the IRIS Center which is sponsored by the U.S. Department of Education. As of 2014, over 470,000 K-12 educators worldwide have used IRIS modules as a professional development tool (IRIS, 2014). While existing literature indicates that most users of the IRIS modules found the modules useful, there is little research on how these modules can be used as an online learning program in higher education to prepare pre-service teachers for RTI. The results of the present study show that IRIS modules are beneficial to pre-service teachers. However teacher educators need to interpret pre-service teachers' online learning outcomes with caution due to the existence of user variations.

Keywords: Response to intervention (RTI), online teaching and learning, IRIS modules, teacher preparation, assessment, special education

Introduction

Implementing the response to intervention (RTI) approach to address the needs of students with academic and behavioral problems in the early years is essential and is permitted by educational laws, such as the Individuals with Disabilities Educational Act (IDEA) of 2004. The IDEA states:

In determining whether a child has a specific learning disability, a local education agency may use a process that determines if a child responds to scientific, research-based intervention as a part of the evaluation procedures used to determine if the child is a child with a disability.

(IDEA 2004, P.L. 108-446, Section 614(b) (6))

With the implementation of RTI in current K-12 schools, it is important that university teacher educators are aware of the new knowledge which prospective teachers will need when they enter the educational field, such as universal screening, progress monitoring, data-based decision making, and tiered interventions (National Center on Response to Intervention, 2014). To understand what and how online learning programs can help increase pre-service teachers knowledge of RTI, this study thus involves examining the use of eight IDEA '04 and Research for Inclusive Settings (IRIS) modules with pre-service teachers at a large, Midwest public university.

Literature Review

Response to Intervention (RTI)

RTI is an approach that “integrates assessment and intervention within a multi-level prevention system to maximize student achievement and reduce behavior problems” (National Center on Response to Intervention, 2014). Typically, RTI involves three tiers to ensure that each student receives an appropriate education. Tier 1 represents the class-wide level in an RTI framework indicating that all students should receive high-quality and evidence-based instruction. It is believed that most students (80%) in the general classroom will make adequate progress with the support of high-quality instruction, differentiated instruction, or some forms of accommodations in the general classroom. Tier 2 is a supplement to Tier 1 for students who do not respond to Tier 1 adequately, and thus need more explicit instruction and more frequent progress monitoring from teachers or other specialists. Tier 3 is a supplement to Tier 1 and Tier 2 for students who need the most intensive and explicit instruction in order to meet their learning needs (Brownell, Sindelar, Kiely & Danielson, 2010; Fuchs & Fuchs, 2006). Figure 1 shows the tiered intervention model of RTI that teachers attempt to modify their lessons for all students to achieve their best.

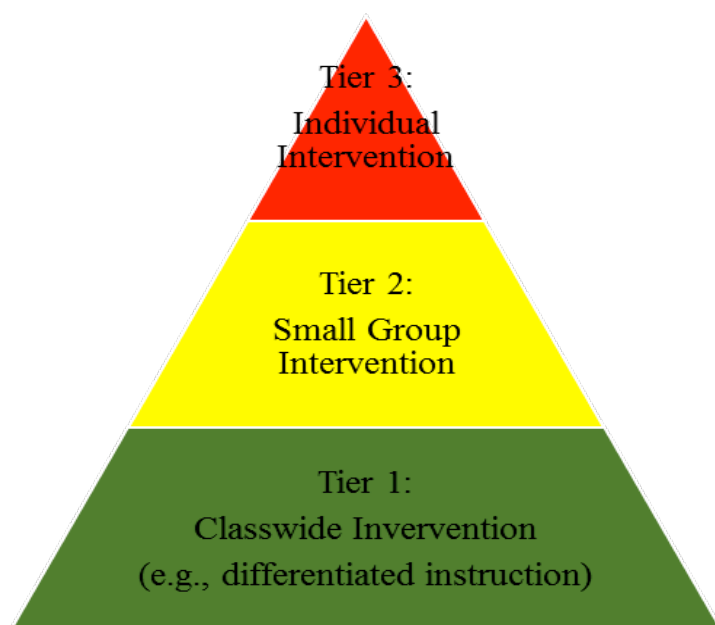


Figure 1. The Tiered Intervention Model

In addition to the multi-level prevention and intervention system, the essential components of RTI include multi-stage universal screening, progress monitoring, and data-based decision making (National Center on Response to Intervention, 2014).

Many studies show that RTI can help measure the improvement or lack thereof of a student as well as provide early intervention to those who are non-discrepant lower achievers (Fletcher & Vaughn, 2009; Mesmer & Mesmer, 2008). The advantages of using RTI also involve aiding students with social, emotional, and behavioral needs (Saeki, Jimerson, Earhart, Hart, Renshaw, Singh, & Stewart, 2011). In spite of the advantages that RTI has, teachers still need to carefully and critically consider how they describe needs, responses, and interventions. Little et al.'s (2012) study reminds educators that there is inconsistency existing in teachers' practices at each tiered intervention. Additionally, the percentage of students acknowledge as at risk differs by measure and the efficacy of instruction (Little et al., 2012).

To maximize the potential of RTI, professional development for pre-service teachers plays an important role in ensuring the integrity of RTI implementation. Researchers have pointed out that with professional development in RTI, it is more likely that teachers will overcome challenges and barriers that they are facing when implementing RTI, and will enhance the fidelity of RTI implementation (Kratowill, Volpiansky, Clements, & Ball, 2007).

Online Learning

Online learning has become an important issue in many colleges and universities. One of the major benefits of online learning is that it provides an opportunity for individuals to learn about knowledge and skills beyond the boundaries of time and space. Research indicates that high-quality online learning programs can promote desired educational improvement and help individuals transform their online learning for real-life practices (Caywood & Duckett, 2003; Dede, Ketelhut, Whitehouse, Breit, & McCloskey, 2009; Harrell & Harris, 2006; King, 2002). Such programs provide users with opportunities to learn about up-to-date information, reflect on their practices, and evaluate their learning outcomes. Smith and his colleagues (2000) summarize the benefits of online learning as follows:

1. Continued education opportunities for those in rural and hard-to-reach areas
2. Increased flexibility for the student pursuing education
3. Controlled use of flexibility of course content and materials for the students
4. An enhanced interactive format offering multiple demonstration and practice opportunities for reinforcing instruction and subsequent comprehension
5. Increased numbers of students can be reached by a smaller number of instructors
6. Expanded geographic areas offering varied information distribution
7. Enhanced communication among students offering diversified perspectives and frames of reference
8. Decreased costs of instruction for students

(Smith, Smith, & Broone, 2000, p. 5)

In addition to the content, high-quality online learning programs have reliable software and clear user guides, so users do not get lost or frustrated with the equipment (Dede et al., 2009). The IRIS modules exemplify all of these qualities, making them a sound online learning tool in the present study.

These modules are developed by the IRIS Center which is sponsored by the U.S. Department of Education, and they are recommended by educators and researchers (Billingsley, Israel, & Smith, 2011). As of 2014, over 470,000 K-12 educators worldwide have used IRIS modules as a professional development tool (IRIS, 2014).

The IRIS modules are developed based on a solid learning theory and research-validated practices outlined by Bransford and his colleagues (2000). They argue that developing expertise is a continuous process through building new knowledge from existing knowledge, gaining well-organized bodies of knowledge, having frequent opportunities for feedback, and learning from mistakes. He believes that “computer scaffolding enables learners to do more advanced activities and to engage in more advanced thinking and problem solving than they could without such help” (Bransford, et al., 2000, p. 214). A total of 54 modules created by the IRIS Center are free and open for public to use. These modules are categorized into different topics by the IRIS Center. Some of the modules are categorized across different topics. Table 1 displays the topics of IRIS modules.

Table 1.

An Overview of IRIS Modules

Topics	Modules
Accommodations	Accessing the General Education Curriculum, Accommodations, etc. (12 modules)
Assessment	Accessing the General Education Curriculum, Accommodations, etc. (9 modules)
Assistive technology	Assistive Technology, Book Share (2 modules)

Behavior and classroom management	Classroom Management, You're in Charge, etc. (6 modules)
Collaboration	Accommodations to the Physical Environment, Addressing the Revolving Door (9 modules)
Content instruction	CSR, High-Quality Mathematics Instruction, etc. (12 modules)
Differentiated instruction	CSR, Differentiated Instruction, etc. (8 modules)
Disability	Accommodations to the Physical Environment, Instructional Accommodations, etc. (5 modules)
Diversity	Cultural and Linguistic Differences, Teaching and Learning in New Mexico, etc. (3 modules)
Early Intervention/ Early Childhood	Collaborating with Families (1 module)
Learning strategies	CSR, Improving Writing Performance, etc. (14 modules)
Math	High-Quality Mathematics Instruction, RTI: Mathematics (2 modules)
RTI	RTI (Part 1): An Overview, RTI (Part 2): Assessment, etc. (10 modules).
Reading, literacy, language arts	Classroom Assessment (Part 2), CSR, etc. (10 modules)
Related services	Assistive Technology, Guiding the School Counselor, etc. (6 modules)
School improvement/ leadership	Accessing the General Education Curriculum, Accountability, etc. (13 modules)
Transition	School Counselors, Secondary Transition (2 modules)

Source: iris.peabody.vanderbilt.edu (IRIS, 2014)

The primary purpose of these modules is to “serve college and university faculty who are preparing the next generation of school personnel, including special education professionals, as well as to serve professional development providers who conduct in-service training for practicing educators” (IRIS, 2012). The structure of each IRIS module is the same. Smith and Robb (2010) summarize the structure of the modules as follows:

Every module begins with a realistic “challenge” intended to capture the user’s attention. The “thoughts questions” that follow allow users to explore and consider what they currently know about the scenario presented in the challenge. Then, in “perspectives and resources” sections, users draw on nuggets of information (e.g., audio interviews, movies activities, and text) in order to actively engage in learning the modules’ main content. Next, in the “assessment” component, users gauge their learning, before moving to the “wrap up” or summary to review the module’s content. (p. 2)

The IRIS field data indicates that one-third to one-half of faculty (N=610) rated the IRIS modules as “very useful (Montrosse, 2012). Additionally, results from a total of 1,744 preservice teachers participating in a survey study show that “the majority of students responding to the survey felt they had learned something from the module,” and “most respondents rated the module as being of high quality and relevant” (IRIS, 2013).

Although the existing literature shows that most users of the IRIS modules found the modules beneficial (Montrosse, 2012; Rodriguez, Gentilucci, & Sims, 2006; Smith, Pion, Skow, Tyler, Yzquierdo, Givner, & Brown, 2005), there are limited experimental or quasi-experimental studies that use a set of IRIS-RTI modules and take into account user variations.

Methods

This study adopted a case-study research method to examine pre-service teachers' learning outcomes on the IRIS-RTI modules. As "an intensive, holistic description and analysis of a single entity, phenomenon, or social unit" (Merriam, 1988, p. 16), case-study research has had a rich history in the educational field since 1950s (Wolcott, 1994). With in-depth information, case-study research can facilitates readers' understanding of complex situations "that cannot be made explicit in most other research designs" (Barone, 2004, p. 25).

Participants and Setting

Twenty-six pre-service teachers enrolled in a special education teacher preparation program at a large, Midwest public university voluntarily participated in this study. Among the participants, five were juniors, sixteen were seniors, and five were interns. The majority of the pre-service teachers in this special education program are female Caucasians. All participants were informed of required written consent procedures prior to participating in the study. All participants were assigned a number, so they could not be personally identified.

This program was selected mainly because all partner schools associated with this teacher preparation program are involved in the implementation of RTI, and thus knowing what and how online learning programs can be incorporated into the teacher preparation program to prepare pre-service teachers for RTI is urgent and meaningful.

Instrument

Because the *Initial-and-Final Thoughts* questions are the same within each IRIS modules, the *Initial Thoughts* questions in each module were used as a pretest instrument and the *Final Thoughts* questions in each module were used as a posttest instrument in this study to examine if the participants applied the content that was covered by each module to address the scenario questions. The eight modules selected for this study were categorized under the RTI topics by the IRIS center:

- Module 1: Classroom Assessment (Part 1): An introduction to monitoring academic achievement in the classroom
- Module 2: Classroom assessment (Part 2) – Evaluating reading progress
- Module 3: An overview
- Module 4: RTI (Part 2) Assessment
- Module 5: RTI (Part 3): Reading instruction
- Module 6: RTI (Part 4): Putting it all together
- Module 7: A closer look at Tier 3
- Module 8: Considerations for school leaders

Data Collection and Procedures

An educational software, the ANGEL Learning Management Suite (LMS), was used to collect data for this study. Each web page of the ANGEL user matrix has seven icons to represent different components of the module. The icons are as follows:

- Component 1: Challenge
- Component 2: Thoughts (initial-thought responses)
- Component 3: Perspectives and Resources
- Component 4: Assessment
- Component 5a: Wrap Up (a review)
- Component 5b: Wrap up (late-thought responses)

- Intervention Fidelity Checklist

During the intervention period, the ANGEL automatically monitored the participants' work. It recorded the time each participant spent on the module and when they turned in their answers to each task. All participants were informed in advance that they must abide by the fidelity of implementation in order to be qualified for receiving their stipend and certificate. The participants were asked to spend two to three uninterrupted hours completing each module abided by the order shown on the ANGEL web page. Accordingly, it would provide evidence to show that participants' pre- to post-intervention gain in knowledge scores was a result of the IRIS modules. In addition to the ANGEL user matrix, all participants were required to submit a self-report fidelity checklist right after they completed each module in order to ensure the integrity of the study. One sample of the ANGEL web pages used in this study is shown in Figure 2.

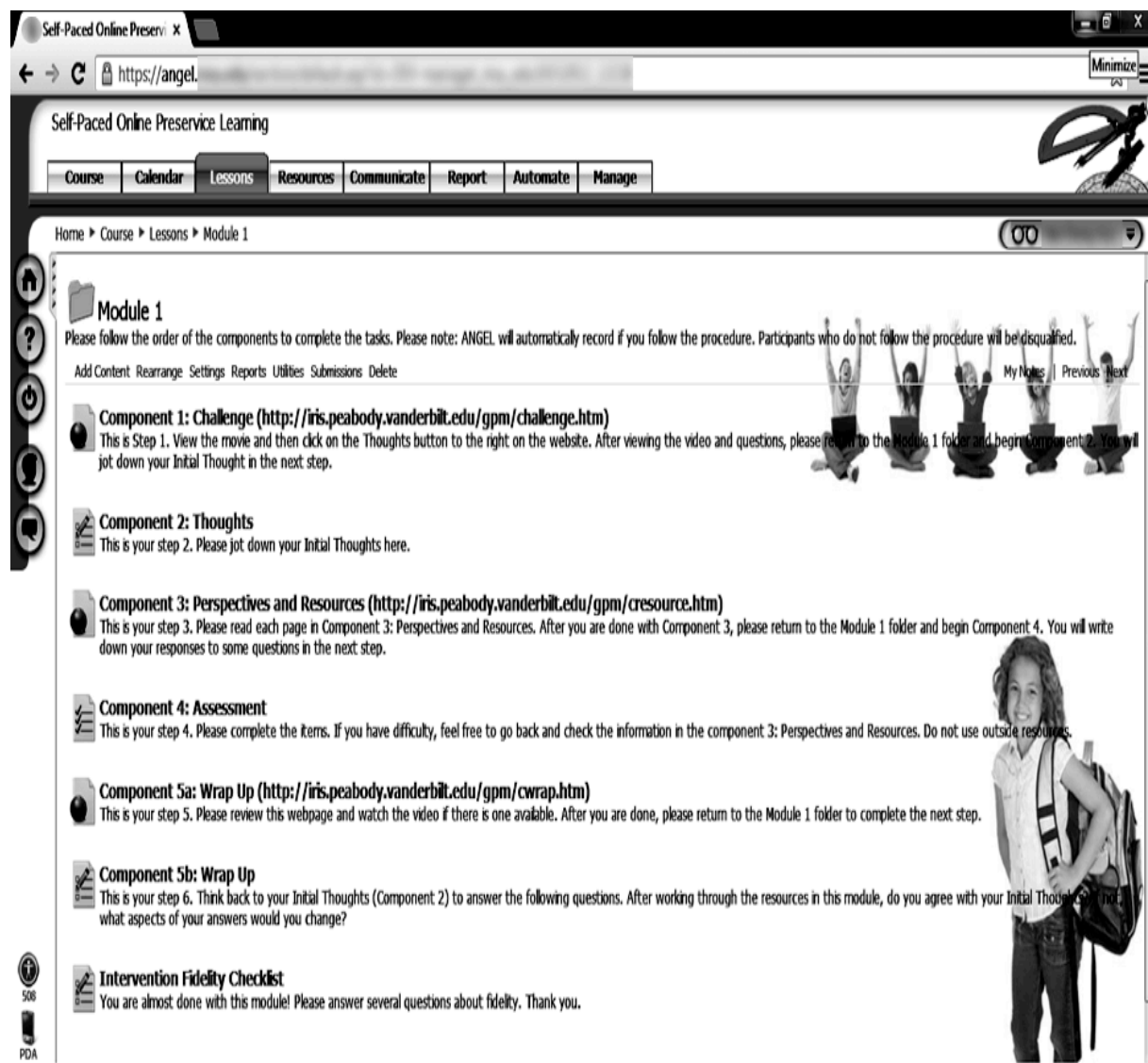


Figure 2. The ANGEL page layout – Module 1 (as an example). (Note. The text is meant for visual reference only. This figure helps readers see what the ANGEL web pages look like in the present study.)

Data Analysis

A codebook was developed through multiple reviews on the module content and the participants' responses. To avoid overlooking the themes in the preset categories (i.e., the module content), emerging

themes from the participants' responses were taken into account in the codebook (see grounded theory; Glaser, 1992). When the participants used the coding themes to address the scenario questions, their responses were coded. The codebook is used to help assign scores to responses and to provide an overview of the responses (Creswell, 2014).

Table 2.

A Sample of the Coding Themes (Initial-and-Final Thoughts questions)

Module 1. Classroom Assessment (Part 1): An Introduction to Monitoring Academic Achievement in the Classroom

- What kind of information would best help Ms. Begay evaluate her students' learning?
- Why is it important for Ms. Begay to be aware of her students' progress?
- What steps can Ms. Begay take to monitor her students' progress throughout the year?

Summative assessment/ year-end assessment	Formative assessment/ progress monitoring	Mastery measurement (MM)	Curriculum- based measurement (CBM)	Benefits of CBM	Steps for progress monitoring
E30					
E31					
E32					
E33					
E34					
E35					
E36					
E37					
E38					
E39					
E40					
E41					
E42					
E43					
E44					
E45					
E46					
E47					
E48					
E49					
E50					

E51
E52
E53
E54
E55

All qualitative data was turned from words into numbers using themes. No participant was double-coded on each theme. That is, even if the participant might use the same theme to address the questions in a module multiple times, his or her use of the theme was only recoded for one time throughout the module, which indicated that he or she already knew the theme and could use it to address the question(s) properly. A doctoral student who was trained in research methods was hired for inter-rater reliability using the coding themes. Disagreements in coding were resolved by discussions and revisiting data multiple times until consensus was reached by the two coders. A sample of the coding themes is shown in Table 2.

Results

The results of Module 1 indicate that many participants were aware of using formative assessments (up from 8% to 58%) after the intervention. Before the intervention, no participant mentioned the use of curriculum-based measurement (CBM) to help Ms. Begay evaluate her students' learning in the scenario. However, after the intervention, 81% of the participants mentioned that the teacher should adopt the CBM approach. Most importantly, the majority of the participants (88%) were able to describe the steps for monitoring students at the end of the module. Although most participants mentioned the use of the CBM approach after completing the module, very few of them discussed the use of the mastery measurement (19%) and the benefits of CBM (12%).

The results of Module 2 reveal that many participants were more familiar with the six steps for progress monitoring after completing the second module of this study. In particular, all participants knew that setting goals (from 19% to 100%) and communicating with students, parents, and other professionals through graphs of data (from 42% to 100%) are important for progress monitoring. However, there were still many participants who did not mention that teachers should first determine and choose an appropriate reading probe (from 4% to 27%). The other area for more participants to grow in is making instructional decisions based on evidence (from 19% to 35%).

In terms of Module 3, none of the participants used the IQ-achievement discrepancy model to address why the school personnel in the scenario were dissatisfied with the way that their school helps struggling students. However, they became more aware of this theme upon the completion of Module 3 (from 0% to 88%). In addition, more participants understood the benefits of RTI for early intervening and support of learning disability identification (from 8% to 38%), and they used these themes to address the questions. Although no participants used the themes of the problem solving approach to RTI and standard treatment protocol to RTI before completing this module, they seemed to be aware of these two approaches of RTI at the end, from 0% to 19 % and from 9% to 23%, respectively. The themes of universal screening and multi-tiered intervention were widely mentioned in the participants' later thoughts about the questions (from 4% to 50% and from 4% to 77%, respectively).

Further, in Module 4, the results indicate that the most significant change in the participants' performance was in the theme progress monitoring raising from 23% to 69%. Most participants were familiar with the theme making instructional instructions, where there was only little increase after completing this module (from 85% to 88%). Although most participants used the theme multi-tiered intervention to address the scenario questions both before and after the intervention, research-validated instruction and standard protocol themes both were rarely used but did rise a few percentages to 8%.

In terms of Module 5, the results vary tremendously between the pre- and post- intervention. The largest difference is from the theme, the five components of reading, which had an 80% increase after the intervention (from 8% to 88%). Additionally, the themes, universal screening (27%) and multi-layered intervention (73%) both decreased slightly after the intervention. One of the themes, daily instructional

plan, went from zero participants mentioning it to 12% after completing this module. Both themes, progress monitoring (31%) and making instructional decisions (19%), still had the same number of mentions before and after the intervention.

The results of Module 6 indicate that after completing Module 6, many participants were more aware of the four components of RTI (i.e., universal screening, multi-tiered intervention, progress monitoring, and making instructional decisions based on evidence). The results continue to show that the participants were still more aware of the multi-tiered intervention (from 73% to 88%) than the other components of RTI. In addition, because this module does not specifically emphasize the five components of effective reading instruction, not many participants used these to address the scenario questions of this module (from 4% to 35%). Another important finding is that more participants used the steps of implementing RTI: collecting student information (from 0% to 65%), classroom arrangement (from 0% to 58%), and materials storage (from 8% to 46%) to address the scenario questions after they completed this module. Likewise, more participants were aware of learner diversity (from 12% to 46%) and effective communication with students and their parents (from 31% to 81%).

Regarding Module 7, some participants had a lot of growth at the Tier 3 intervention of RTI. In particular, these participants were aware of using research-validated instruction at the Tier 3 intervention (from 4% to 38%). Moreover, more than half of the participants mentioned the importance of communicating with parents (from 19% to 62%) and being aware of English language learners' needs regarding the third tier of RTI. Furthermore, many participants mentioned issues about who should be involved in the IEP team after completing this module (from 4% to 38%). However, very few participants used the five components of effective reading instruction in this module before and after the intervention.

The final module (Module 8) reveals an important finding: most of the participants had a general understanding of how RTI can be implemented in the school before they completed Module 8. Prior to completing this module, most of them already knew that the school leader should be well informed and knowledgeable about RTI and should be able to introduce this approach to teachers and other personnel in the school. However, very few of the participants knew the steps of implementing a new approach in the school. After completing this module, all participants were more aware of these steps and used them to address the scenario questions.

The t value of 14.747 ($p = .000$) reveals that the participants made significant progress on their responses to the questions of the eight scenarios after the intervention. However, the results show that there was no significant correlation between the participants' responses to the *Initial-and-Final Thoughts* questions ($r = .249$, $n = 26$, $p = .220$), which indicates that most participants demonstrated their immediate changes of knowledge after the completion of each individual module, regardless of their prior knowledge about the module's content.

The direct quotes from participants' responses indicate they were able to give more thorough and concrete explanations when addressing scenario questions. For example, when being asked in Module 8: *How can Mr. Irwin build support for adopting the RTI approach at Mayflower Elementary?* Participant E36 stated:

(Pre) I think he needs to start it at one grade level and then slowly integrate it to other classes so that it does not get to overwhelming right away.

(Post) First it is important to have a small meeting with a couple of important people in the school that have a lot of influence on other people opinions and how they do things in the school. By having a small meeting he can discuss with the people and inform them on what he would like to do in the school, the positives of the program and provide additional information. Also, he will be able to answer questions and involve the members into the decision instead of just telling the school.

It is clear that Participant E36 addressed the scenario questions with great detailed information after completing this module. Similarly, Participant E48 stated:

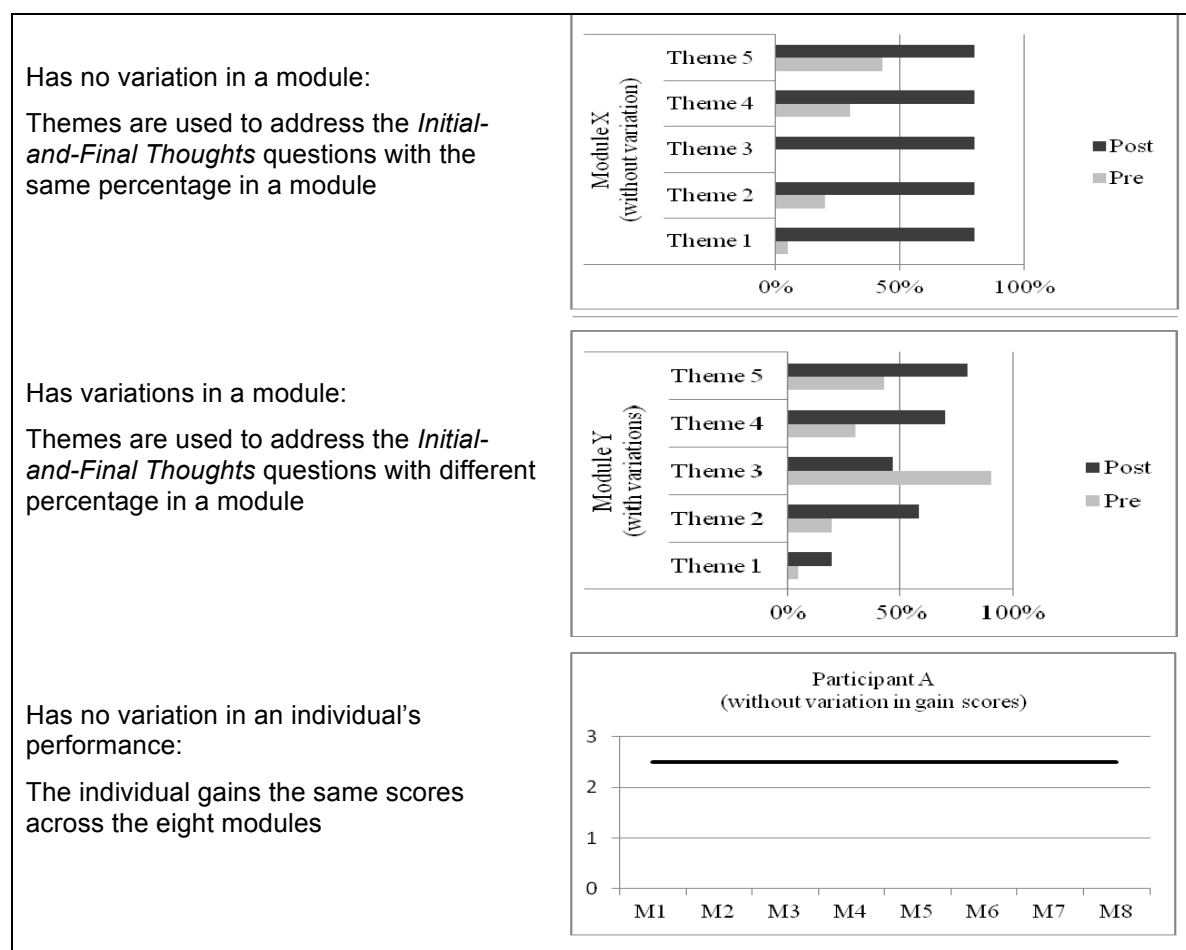
(Pre) He can implement training for his staff to learn how to use RTI.

(Post) He can build support by first learning about RTI by attending informational meetings. Then, he needs to present his findings to a small group of faculty members, in which everyone who would be affected by the implementation of RTI is represented. Once he has the support of a smaller group of faculty, he can look to gain the support of the entire faculty.

Before completing Module 8, E48 suggested that using RTI should help. However, it was until he/she completed Module 8, he/she was able to provide concrete steps about how the teacher can implement RTI training for his staff more effectively.

User Variation

When looking closely at participant's performance, it is found that some participants made more progress than others. Moreover, some participants gained more knowledge from some modules than the other modules; that is, they did not make the same amount of progress in all the modules. The findings indicate there were variations among the modules and among the participants. Figure 3 illustrates the analogy of the variations after an intervention.



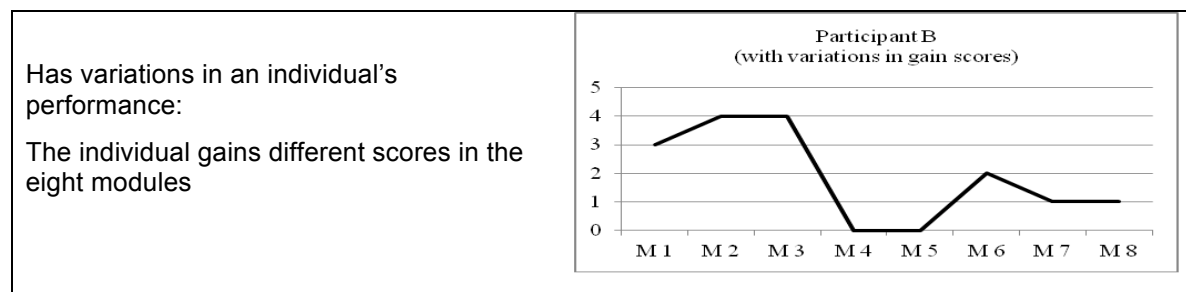
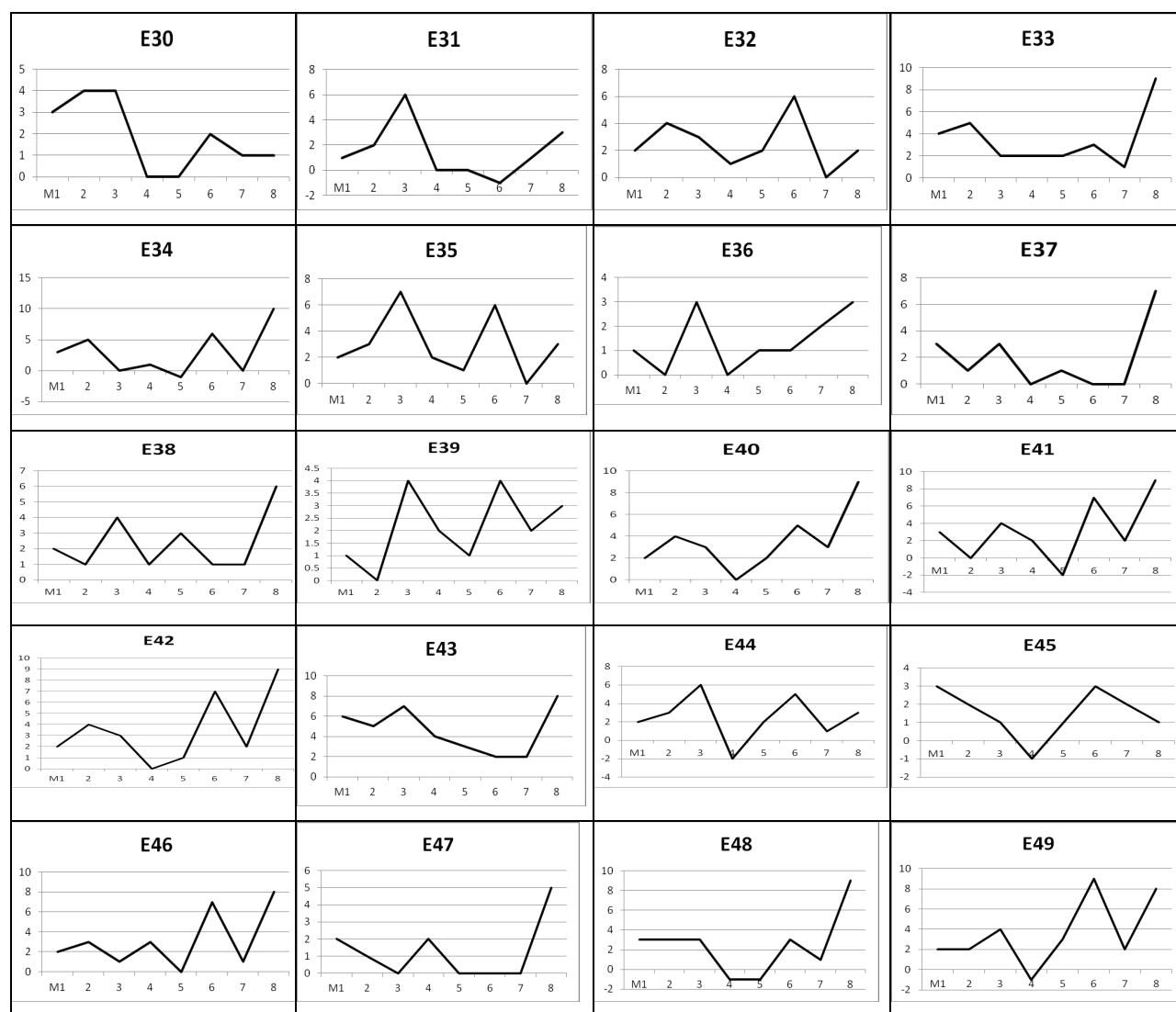


Figure 3. Variations analogy

Variations across learners and variations over time have been discussed in the field of education (Swierzbins, Morris, Anderson, Klee, & Tarone, 2000). The present study also reveals that there were variations in individual participants' online learning through the IRIS modules (see Figure 4).



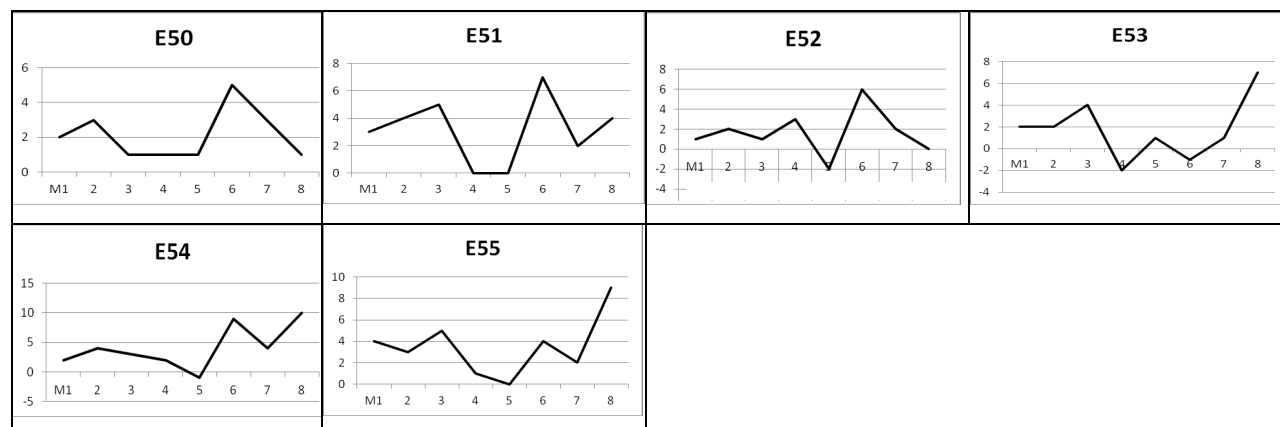


Figure 4. Variations in individual participants.

The vertical axis represents the gain scores in each module; the horizontal axis represents Model 1 to Module 8.

To sum it up, these particular online modules were successful in terms of the growth of the participants' knowledge of RTI. Most participants demonstrated their immediate progress after completing each module. However, there were variations among participants' performance on the eight IRIS modules.

Discussion and Conclusion

This study holds the IRIS modules accountable for participants' performance and what they learned as a result of the modules due to the uninterrupted intervention. Several reasons may explain why the participants performed better after completing the modules. First, the content of the IRIS modules is well developed and provides the participants with in-depth knowledge and concrete examples to solve the problems in the scenarios. As stated in the literature section, high-quality and reliable online learning programs can promote desired educational improvement (Dede et al., 2009). Thus, while there were some differences in the participants' background knowledge of RTI prior to the modules, the participants all improved in the number of themes identified in the eight modules. Second, intensive intervention has been found helpful in educational research (Brownell et al., 2010), and thus it may not be surprising to see that the two to three uninterrupted interventions through IRIS modules was powerful. However, the results illustrate that several participants replaced their *Final Thoughts* answers completely with new information, and did not critically integrate their *Initial Thoughts* answers. Therefore, it is necessary that teacher educators should cultivate pre-service teachers' critical thinking skills in online learning to maximize their learning outcomes. Finally, because most participants had very little prior knowledge about RTI, it was predictable that they make significant (but still not adequate) progress after the new information was introduced. The findings show that after the intervention, there were still many themes in the modules not addressed by the participants.

Regarding user variations, the results of the present study are consistent with previous studies on variations in learning through the IRIS modules (e.g., Smith et al., 2005). Smith and her colleagues (2005) noticed that although the learners who worked on the various modules demonstrated significant changes in their *Initial-and-Final Thoughts* answers, their perceptions about learning-related questions differed from module to module. Similarly, the results of the present study show that with the same module, some themes were more frequently used than others. Moreover, although this study reveals that while there was clearly overall learning as a group, there was quite a range in what might be learned, with some participants doing quite well with others not doing as well.

In theory, while user variations are unavoidable in research, the variations should be taken into account in the hierarchic regression model in order to interpret the effectiveness of IRIS models more accurately. In addition, the structures of the *Initial-and-Final Thoughts* questions and the contextual variables such as module topics should also be considered. It is possible that the participants did not use certain themes because of different language structures or due to different module topics.

In practice, when teacher educators are aware of which module(s) pre-service teachers have a low level of prior knowledge and of the content of module(s) pre-service teachers improve less, teacher educators should reinforce these themes in coursework and/or give pre-service teachers opportunities to revisit these modules. In this study for example, the participants made less progress in the following themes: CBM benefits (Module 1), daily instructional plans (Module 5), and English learners (Module 5). Therefore, if these modules had been assigned as part of a teacher preparation programs, these are the topics that should be reinforced. In addition, this study reveals that many participants modified their *Final Thoughts* answers based on the content of the module, and did not mention or keep everything from their *Initial Thoughts* answers. It is important that teacher educators are aware of whether pre-service teachers' later answers are simply replaced by new information they learn from modules. Prior to taking IRIS modules, pre-service teachers need to have critical thinking skills and should answer *Initial-and-Final Thoughts* questions more critically and inclusively. These procedures involve ensuring that pre-service teachers not only make significant progress on their post responses, but also made adequate progress through the coursework and through the assistance of the modules.

Furthermore, although participants showed immediate recall on some of these themes, it may be hard to tell how much of this made it into their long-term memory versus short-term recall. If teacher educators want to know how well pre-service teachers retain the knowledge that they learn from the content of the modules, they can implement a post-test at the end of a semester using the *Final Thoughts* questions as a maintenance assessment tool. Utilizing the components that are already embedded in these online modules to develop an maintenance assessment can maximize the potential of these modules and make instructional time more efficient.

Limitations

There are some limitations to the study. First, the sample size in the present study is small, and thus future research with a larger sample size is needed. It is important to note that each module took participants two to three uninterrupted hours to complete and eight modules related to RTI were required. Despite the small sample size, the in-depth data collected in the present study still produces a deep understanding of preparing pre-service teachers for RTI through IRIS modules. Second, it is possible that the participants' knowledge was still at an awareness level in early trials and does not reflect the deep connections of someone with extensive training and experience working with RTI in schools. Thus, it is recommended that future studies should examine pre-service teachers' long-term knowledge retention with taking into account mediating and moderating variables (Baron & Kenny, 1986), and should include data from pre-service teachers' field-based practicum.

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