

**The Impact of Extended Professional Development and a Comprehensive Approach  
to Assessment on Teacher Use of Assessment for Learning Practices**

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## Abstract

This study sought to examine the impact of teachers' participation in an extended period of embedded professional development (PD) emphasizing teachers' use of assessment for learning practices (AFL) in extended problem based units of instruction within a comprehensive AFL framework. The extended and comprehensive approach of using both course work and learning teams provided them with an in-depth understanding of these practices and the opportunity to apply that understanding in their daily work with their students. The eight elementary grade teachers' assessment practices changed dramatically as a result of the PD provided. Those changes were maintained even after external support was withdrawn, and teachers intended to continue the use of AFL strategies in the future.

## Introduction and Theoretical Background

Despite an ever burgeoning research base and numerous articles advocating the use of formative assessment (Andrade & Cizek, 2010; Black & Wiliam, 1998; Reeves, 2007) or assessment for learning (AFL) practices in teachers' classrooms, actual adoption and use of such strategies lags considerably behind what is being promoted nationally and internationally. The what, how, and why needed to move this agenda ahead involves knowledge of the content of AFL, an approach to professional development that supports teachers' adoption and use of such ideas, and teachers making sense of how to enact AFL ideas in their classrooms (Thompson & Wiliam, 2007). A part of this problem may be due to variations in what is interpreted as formative assessment or assessment for learning and whether it represents a comprehensive integrated approach to classroom assessment or whether such initiatives represent a piece meal approach. Professional development in AFL is often limited to teachers learning how to align classroom learning targets and assessments with state standards and district curriculum guides or the use of student performance data to group students. A related problem is how best to design PD that would lead to changes in teachers' classroom assessment practices. Successful and sustained PD has a meager history of success (Garet, Porter, Desimone, Birman and Yoon, 2001) especially when external support or initiatives are withdrawn. A deepening understanding of the characteristics of effective PD (Borko, 2004; NSDC, 2001; Wei et al , 2009) that is school based, visibly supported by school leaders, meaningful to teachers, flexible, embedded in teachers' daily work, sustained over time, and supported through collaborative participation in learning teams has garnered more success particularly when applied to the use of AFL (Thompson & Wiliam, 2007). However that success is still tempered by teachers being able to make connections between assessment theory and research and how to enact those ideas in concrete and specific ways in their classrooms. There is a continuing need to understand which AFL practices make sense to teachers, which practices they are likely to adopt and continue using, and what factors affect teachers developing this kind of practical knowledge in the use of classroom assessment practices.

### Identification of AFL Practices and Description of the PD Provided

Working with third through fifth grade teachers in an inner city elementary school (69% minority students, 62% on free and reduced meals) on the use of AFL strategies using guidelines for effective PD over an extended period of time, provided the opportunity to examine changes in teachers classroom practices. The AFL strategies were presented as a comprehensive and integrated approach stressing student involvement in the assessment process (Stiggins, Arter, Chappius & Chappius, 2006; Thompson & Wiliam, 2007). In addition to developing an understanding of assessment and its relationship to student motivation, the AFL strategies focused on clarifying learning targets, rubric development, providing effective feedback, student self-monitoring and self-assessment, goal setting, effective questioning and discussion, and the use of data to plan and adjust instruction and meet individual student needs. The AFL strategies were taught separately as well as

being imbedded in the development and use of problem based (PBL) units of instruction and the teaching reading comprehension and writing skills for expository content.

Initial involvement of university and school district assessment staff with teachers in the school occurred during grade level data team meetings in the 2006-07 school year. During these meetings we sought to expose teachers to AFL ideas, vocabulary and practices, however an informal review of the impact of these sessions lead to the conclusion that they had had little impact on teachers' use or understanding of AFL practices. Teachers needed to have a more in-depth and comprehensive background in assessment with the opportunity to use the practices over time if teachers were going to adopt such practices in their everyday teaching. This lead to a small grant to support the work of university staff and provided teachers and district staff with continuing education credits as a motivation for participation. A year-long assessment course was offered during the 2007-08 school year emphasizing the classroom use of AFL practices. Twenty two teachers from four schools and twenty one district staff participated in the course. Assignments in the course focused on teachers trying out AFL practices in their classrooms, sharing their experiences with colleagues, and collecting and comparing data on student achievement data from district benchmark quarterly exams. However, teachers' ability to transfer the ideas to actual practice in the classroom, degree of discussion with colleagues, and actual collection and review of data was limited. Many of the ideas presented needed to be discussed more and often needed to be revisited. Teachers wanted more concrete examples and more opportunities to explore using the practices in their classrooms. By the end of the course there was an obvious need for a more focused and structured process for teachers' work.

The following year, teachers' work was supported by stipends from a state grant and focused on teacher learning teams as a major means of supporting teachers' use of the strategies and development of PBL units of instruction. Project staff participated in over 70 learning team meetings that year and held two one-day workshops and four three-hour after school workshops. The format for the bimonthly learning team meetings involved teachers sharing their experiences with using the strategies and developing PBL units of instruction, exploring new ideas, and action planning for practices they would use in the next week or two. The focus of these meetings were determined by what practices teachers were interested in or currently working on and project staff's assessment of what strategies teachers were ready to work on. Over the span of two years teachers were involved in approximately 75 hours of PD which is consistent with National Council for Staff Development recommendations for providing sustained professional development likely to have an impact on teacher practices and students' learning (Wei, et al, 2009). Throughout those two years, emphasis was placed on embedding the AFL practices into teachers' day-to-day work linked to district curriculum guides and school staff development plans and providing an overall understanding of and integrated approach to the use of AFL practices. Emphasis was also placed on involvement of students in the processes, and the project sought to avoid the perception that the PD provided was an add-on to what teachers were responsible for anyway. No additional external support was provided over the 2009-10 school year or during the 2010-11 school year. Because

university staff and district assessment staff had worked closely with 3<sup>rd</sup>, 4<sup>th</sup>, and 5<sup>th</sup> grade teachers over an extended period of time, particularly in this school, and had collected self-report, focus group, and follow-up data on teachers' use of these strategies the opportunity was provided for examining the initial and sustained impact of the PD provided.

This study sought to address the following questions:

1. Which AFL strategies did the teachers adopt as a result of participation in the year-long PD course followed by year-long PD focusing on teachers working in learning teams?
2. Did teachers continued to use these strategies when external support was withdrawn?
3. Which strategies did teachers find of value and were committed to use in the future?
4. What factors impacted teachers use and commitment to various AFL practices?

#### Data Analysis: Mixed Method Approach

A retrospective survey (See Goehart & Hoogsstratein, 1992; Lamb & Tschhard, 2005 on the validity of retrospective surveys) employing a 5 point Likert type format (items were anchored by descriptive statements: 1 indicated little or no use or understanding, 5 indicating extensive use or understanding), open ended teacher responses and a focus group meeting were used to examine these questions. The survey used to assess teachers use of the strategies focused on in the two years of PD is provided in the appendix A. Eight teachers responded to the survey and participated in the focus group meeting. Teachers' open-ended comments and the focus group meeting provided a means of exploring the teachers explanations of how and why their classroom practices changed. In addition a focus group meeting was held in March 2011 with 3<sup>rd</sup>, 4<sup>th</sup> and 5<sup>th</sup> grade teachers to further explore teachers continued use of the ideas and strategies that the PD had focused on, however, grade level membership had changed such that only one grade level team was still composed of teachers who had experienced two years of the PD.

Table 1 in the Appendix B presents descriptive data on teachers responses to the survey asking teachers to rate: (A) How well they understand a particular assessment strategy or idea, (B) How much had understood or used the strategy or idea prior to participating in the PD provided, (C) How much they had used the strategy the previous year while engaging in the second year of PD, (D) How much they had used the strategy during the past year after the PD had ended and there had not been any external PD to support their continued use, and (E) How much they intended to use the strategy in the future.

Comparing teachers' reported initial use to their use during the 2008-09 school year after the two years of PD (Table 2) resulted in 20 of the 20 paired t-tests being significant, 4 at the .001 level, 12 at the .01 level, and the remaining 4 at the .05 level despite the small sample size. As responses to items on the survey are correlated interpreting the meaning

of changes on individual items based on multiple t-tests should be made with considerable caution. Teachers reported an increased understanding of assessment and AFL strategies, the relationship of assessment to student motivation and in the use of each AFL practice. They also reported an increased use of strategies for integrating reading comprehension and writing skills in PBL units of instruction, and increased development and use of PBL.

Rank ordered from most to least, the greatest differences were in the use of self-monitoring/self-assessment (An unusually large t-value of -7.8, negative values indicating increased use), integrating writing skills into PBL units of instruction, understanding using assessment to motivate student learning, the use of PBL, and integrating AFL practices into PBL units of instruction. Changes related to PBL likely reflect the focus of the state funded grant. The five areas of least change ranking from 16<sup>th</sup> to 20<sup>th</sup> were integrating reading comprehension skills into PBL units of instruction (16<sup>th</sup>), using peer questioning and discourse, using examples of strong and weak student work to develop rubrics, the use of data to adjust instruction, and conducting effective discussions. Modest changes in the use of peer questioning and discussion and conducting effective discussions reflected already high levels of teacher use prior to the PD. The use of data to adjust instruction likely reflected the district's continuing focus on using data from benchmark assessments to review and adjust instruction.

Comparing teachers' use of strategies from the 2008-09 school year to their use in the 2009-10 school year (Table 3) when no external support was provided did not result in any statistically significant results. Most of the mean changes were in a positive direction but not statistically significant. This may have been because teachers' high levels of use after the PD simply continued the following year. There were two exceptions to this trend, that while not significant at the .05 level, were close to marginally significant. Teachers reported an increased level of using data to plan and adjust instruction ( $t = -2.049$ ,  $p = .08$ ) and a decreased level of using student self-monitoring and self-assessment ( $t=2.049$ ,  $p=.08$ ). Increased use of data was not surprising as it continues to be a major focus of district PD, however the drop in self-monitoring/self-assessment was surprising. Six of 8 teachers' written comments in response to the question of which strategies had the "most merit" and were the "most important to use" noted this area. It was also the area of greatest initial change.

Teachers stated that in the year following the PD they found it difficult to find adequate time to develop PBL units of instruction. A piece meal approach of trying to work on such units during their daily 45 minute planning time did not provide the time and concentrated effort they needed and as a result they had greatly reduced the use of these extended units of instruction. The extended units of science instruction integrating reading and writing skills had prompted more extensive and varied use of AFL strategies. Many strategies advocated in teaching expository reading and writing skills overlap with AFL strategies and extended and complex PBL units of instruction are more likely to foster the use of rubrics, student discussion, feedback, and student self-monitoring and self-assessment.

The focus group meetings with each grade level during the 2010-11 school year found that almost none of the teachers were using PBL units of instruction, teachers found it too time consuming and difficult to plan and develop these units in the limited amount of time teachers had in their grade level planning sessions. However, there were differences across grade levels in the use of self-assessment, goal setting, the use of feedback and the rubrics. Fourth-grade and fifth-grade teachers indicated infrequent use of self-assessments and goal setting and a lack of understanding of AFL practices or how they might be used to promote student motivation. Having only one teacher on the grade level team who had participated in the PD limited the team's ability to dialogue about and plan for using these practices in instruction. On the other hand, the 3<sup>rd</sup> grade teachers continued to use these practices and in fact indicated how they had modified self-assessment practices by focusing on a limited area for review at one time or other words had combined self-assessment with focused review. These teachers commented on how working together over an extended period of time with in their grade level who had a substantial background in AFL strategies allowed them to efficiently and effectively plan and review the use of these strategies. Teachers were able to engage in "thoughtful adaptation" of what they had learned. Teachers noted that the understanding provided by the course provided a framework for thinking about AFL practices, and working in learning teams and with students facilitated making connections between those ideas and concrete applications of these ideas in the classroom. Participating teachers in other grade levels noted that some of their colleagues, who had not had the course but did participate in learning teams, were not able to make these connections and were unclear about why or how to use several of the AFL practices. When asked what would be more ideal teachers indicated more of an interwoven mix of both the course work and learning team activities would be better. Both the extended course which provided an in-depth and comprehensive background for using AFL strategies and the opportunity to further craft these strategies for use in their teaching as a result of participating in learning teams over an extended period of time contributed to efficient and thoughtful use of the strategies.

Finally, differences in teacher responses reflecting how much teachers had used the strategies in the past year and how much they planned to use them in the future (Table 4) were used to explore teachers' continued commitment to the use of AFL strategies. Five of 19 paired t-test comparisons were significant at the .01 level, four of which reflected the intention to use more PBL which integrated reading and writing skills, and AFL practices. The other significant difference (.01) was to increase student involvement in developing rubrics. Four other comparisons were statistically significant at the .05 level: continued use of AFL practices in general, using assessment to motivate student learning, using effective/descriptive feedback, and using examples of strong and weak student work to develop rubrics. Overall this reflects a strong teacher value for and commitment to continued use of AFL strategies while at the same indicating strategies that teachers find difficult to integrate into their daily practices, especially the use of PBL. Teachers did see PBL as a means of integrating reading and writing skills as well as AFL strategies but were reluctant to develop PBL units of instruction given planning constraints and the need to "cover" the curriculum.

## Conclusions and Implications for Research and Practice

Teachers' assessment practices changed dramatically as a result of the PD provided. Those changes were maintained even after external support was withdrawn, and teachers intended to continue the use of AFL in the future. The extended and comprehensive approach of using both course work and learning teams had provided them with an in-depth understanding of these practices and the opportunity to apply that understanding in their daily work with their students. It is not surprising that in-depth training coupled with the use of learning teams over an extended period of time would lead to such changes but insights gained from this study provided additional dimensions to consider in providing effective PD in the use of AFL practices. Focusing on extended integrated units of instruction such as PBL provides a complex and useful context for enacting more of the complex AFL strategies practices, however most teachers' daily schedules, limited time for planning, and need to cover the curriculum subvert such efforts. Furthermore, teachers in the same grade level need to have an in-depth and similar background in the practices in order to work productively together. When they don't, teachers cannot engage in the kind of thoughtful dialogue needed to move them forward in crafting ideas into concrete classroom practice.

While much is now known about characteristics of effective professional development and the effective use of formative assessment there is a need to better understand how other contextual factors such as approaches to instruction and the dynamics of teachers working together interacts with these initiatives to either promote or subvert the process. Integration of effort is key.

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## Appendix A

### Survey: Knowledge and Use of Assessment and Assessment for Learning Strategies

Number of years you have taught? \_\_\_\_\_ Grade level your teach \_\_\_\_\_

How many years have you been working with the ideas stressed in an Assessment for Learning (AFL) approach?    1        2        3        4        5 or more years

The following survey contains questions about your understanding and use of several of the ideas and strategies having to do with AFL and problem based learning (PBL). If the question asks about previous use please answer that part in reference to how much you used or understood the idea/strategy prior to any work with AFL (Prior to the ODU course or grant funding). If the question asks about last year please reference how much you used the idea/strategy during the 2008-2009 school-year when the project was funded. If the question ask the about this past year reference how much you have used the idea/strategy during this immediate past year.

For each question in part 1 please circle your response on the 1 to 5 scale:

1. Using a balanced approach to assessment (using assessment to measure what students have learned and using assessment to promote learning)

- |    |   |   |   |   |   |   |   |
|----|---|---|---|---|---|---|---|
| A. | I <u>do not</u> understand this idea/strategy                                     | 1 | 2 | 3 | 4 | 5 | I <u>understand and am well prepared</u> to use this idea/strategy                |
| B. | Previously, I <u>did not use</u> this idea/strategy                               | 1 | 2 | 3 | 4 | 5 | Previously, I <u>used</u> this idea/strategy extensively                          |
| C. | Last year (2008-2009) I <u>did not use</u> this idea/strategy                     | 1 | 2 | 3 | 4 | 5 | Last year (08-09) I <u>used</u> this idea/strategy extensively                    |
| D. | This past year (2009-2010) I <u>did not use</u> this idea/strategy                | 1 | 2 | 3 | 4 | 5 | This past year (09-10) I <u>used this</u> idea/strategy extensively               |
| E. | I <u>do not find</u> this idea/strategy useful and <u>do not plan</u> on using it | 1 | 2 | 3 | 4 | 5 | I <u>find</u> this idea/strategy very useful and <u>plan</u> to continue using it |

2. Using assessment "for" learning

A.	I <u>do not</u> understand this idea/strategy	1	2	3	4	5	I <u>understand and am well prepared</u> to use this idea/strategy
B.	Previously, I <u>did not</u> use this idea/strategy	1	2	3	4	5	Previously, I <u>used</u> this idea/strategy extensively
C.	Last year (2008-2009) I <u>did not</u> use this idea/strategy	1	2	3	4	5	Last year (08-09) I <u>used</u> this idea/strategy extensively
D.	This past year (2009-2010) I <u>did not</u> use this idea/strategy	1	2	3	4	5	This past year (09-10) I <u>used</u> this idea/strategy extensively
E.	I <u>do not</u> find this idea/strategy useful and <u>do not</u> plan on using it	1	2	3	4	5	I <u>find</u> this idea/strategy very useful and <u>plan</u> to continue using it

The rest of the survey follows the same format asking about each of the following:

3. Using assessment to motivate student learning.
4. Using effective/descriptive feedback
5. "Unwrapping" learning targets in "student friendly" language.
6. "Unwrapping" a reasoning/strategy use level learning target
7. Being able to effectively lead students in reasoning/strategy use level discussions.
8. Using effective goal setting with students
9. Using data from assessments (e.g. "common", grade level, or quarterly assessments) to plan and adjust instruction.
10. Use information from assessments to help individual students meet learning targets.
11. Having students self-monitor or self-assessment their learning (as in "You be George").
12. Be able to develop appropriately constructed selection type items.
13. Use peer questioning or peer discourse to support student learning
14. Conduct effective classroom discussions.

15. Use examples of strong and weak student work in developing and using rubrics.
16. Have students participate in developing and using rubrics for a performance assessment.
17. Develop and use problem based learning (PBL) units of instruction.
18. Integrate reading comprehension strategies into PBL activities.
19. Integrate writing skills into PBL activities.
20. Integrate assessment for learning strategies into PBL activities.

Which of the following best characterizes (circle only one) your use of assessment for learning strategies?

1. For the most part I find the use of these strategies to be confusing.
2. While I have tried to understand and use these strategies I find their application to the classroom to be of little use.
3. I find these strategies to be of some use.
4. I find many of these strategies useful.
5. I use the strategies focused on in the project and have extended the use of these strategies to other areas not explicitly covered in the project.
6. I frequently use the strategies, use them flexibly and in different ways, and have extended the use of the strategies to other areas not explicitly covered in the project.

The following are open-ended items that were used in written form and as a focus of discussions during focus group meetings.

What strategies do you think have the most merit and are most important to use? Why? What has led you to adopt and use these strategies? (Please list and explain your reasons for using each strategy or experiences with students that have led you to use these ideas of strategies)

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Which strategies have you tried out or been exposed to that you have decided not to use in the future? Why have you decided not to use a particular strategy? Please list and explain your reasons or experiences that have led you to decide not to use that idea of strategy.

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Appendix B

TABLE 1

*Descriptive Statistics*

Survey Question	N	Min.	Max.	Mean	Std. Deviation
Number of Year Have Taught	8	4	30	11.75	9.377
Grade Level taught	8	1	5	3.00	1.414
Years working with AFL	8	2	4	3.50	.756
1. Understand using a balanced approach to assessment	8	2	5	4.38	1.061
Used previously	8	1	3	2.38	.744
Used last year	8	3	5	4.00	.535
Used past year	8	3	5	4.25	.707
Plan to use	8	4	5	4.75	.463
2. Understand using assessment for learning (AFL)	8	2	5	4.50	1.069
Used previously	8	1	3	2.00	.926
Used last year	8	3	5	3.88	.835
Used past year	8	2	5	4.25	1.035
Plan to use	8	4	5	4.88	.354
3. Understand using assessment to motivate students	8	3	5	4.50	.756
Used previously	8	1	3	1.88	.641
Used last year	8	3	5	3.87	.835
Used past year	8	3	5	4.00	.756
Plan to use	8	3	5	4.63	.744
4. Understand using effective/descriptive feedback	8	4	5	4.75	.463
Used previously	8	1	4	2.63	.916
Used last year	8	4	5	4.25	.463
Used past year	8	3	5	4.13	.835
Plan to use	8	4	5	4.63	.518

5. Understand “Unwrapping” in student friendly language	8	4	5	4.88	.354
Used previously	8	1	4	2.13	1.126
Used last year	8	4	5	4.50	.535
Used past year	8	4	5	4.50	.535
Plan to use	8	4	5	4.75	.463
6. Understand “Unwrapping” reasoning level learning targets	8	2	5	4.13	1.126
Used previously	8	1	4	1.63	1.061
Used last year	8	2	5	3.63	.916
Used past year	8	1	5	3.50	1.195
Plan to use	8	1	5	3.88	1.356
7. Understand effectively leading student reasoning level discussions	8	3	5	4.00	.756
Used previously	8	1	3	1.63	.744
Used last year	8	2	4	3.38	.744
Used past year	8	3	5	3.63	.744
Plan to use	8	3	5	4.00	.535
8. Understand using effective goal setting	8	4	5	4.88	.354
Used previously	8	1	4	2.63	.916
Used last year	8	3	5	4.38	.744
Used past year	8	3	5	4.25	.886
Plan to use	8	4	5	4.63	.518
9. Understand using data to plan and adjust instruction	8	5	5	5.00	.000
Used previously	8	1	4	3.38	1.061
Used last year	8	4	5	4.62	.518
Used past year	8	5	5	5.00	.000
Plan to use	8	5	5	5.00	.000
10. Understand using information to help individual students meet targets	8	5	5	5.00	.000

Used previously	8	1	5	2.88	1.246
Used last year	8	4	5	4.63	.518
Used past year	8	4	5	4.63	.518
Plan to use	8	4	5	4.88	.354
11. Understand having students self-monitor or self-assess	8	3	5	4.75	.707
Used previously	8	1	2	1.38	.518
Used last year	8	3	5	4.50	.926
Used past year	8	3	5	4.13	.835
Plan to use	8	3	5	4.50	.756
12. Understand being able to construct selected type items	8	1	5	4.00	1.309
Used previously	8	1	3	2.13	.835
Used last year	8	1	5	3.50	1.195
Used past year	8	1	5	3.63	1.302
Plan to use	8	1	5	3.75	1.282
13. Understand using peer questioning or peer discourse	8	3	5	4.50	.756
Used previously	8	1	4	2.75	1.035
Used last year	8	3	5	3.63	.744
Used past year	8	2	5	3.63	1.061
Plan to use	8	2	5	4.00	1.069
14. Understand conducting effective classroom discussions	8	3	5	4.38	.744
Used previously	8	2	5	3.63	1.061
Used last year	8	4	5	4.63	.518
Used past year	8	4	5	4.75	.463
Plan to use	8	4	5	4.75	.463
15. Understand using student work in developing and using rubrics	8	3	5	4.63	.744
Used previously	8	1	3	1.88	.641
Used last year	8	2	5	3.50	1.195
Used past year	8	2	5	3.50	1.069

Plan to use	8	3	5	4.13	.835
16. Understand having students participate in developing rubrics	8	3	5	4.00	.535
Used previously	8	1	3	2.00	.926
Used last year	8	2	4	3.13	.641
Used past year	8	2	4	2.88	.835
Plan to use	8	3	5	4.00	.756
17. Understand developing and using problem based learning (PBL)	8	4	5	4.38	.518
Used previously	8	1	3	1.25	.707
Used last year	8	2	5	3.62	1.188
Used past year	8	1	4	2.75	1.035
Plan to use	8	3	5	4.25	.707
18. Understand integrating reading comprehension strategies into PBL	8	4	5	4.50	.535
Used previously	8	1	3	1.75	.886
Used last year	8	1	5	3.75	1.488
Used past year	8	2	5	3.00	1.195
Plan to use	8	3	5	4.25	.707
19. Understand integrating writing skills in PBL activities	8	4	5	4.50	.535
Used previously	8	1	3	1.38	.744
Used last year	8	1	5	3.63	1.302
Used past year	8	1	5	2.75	1.165
Plan to use	8	4	5	4.25	.463
20. Understand integrating AFL into PBL activities	8	1	5	3.63	1.188
Used previously	8	1	1	1.00	.000
Used last year	8	1	5	3.13	1.246
Used past year	8	1	4	2.38	1.188
Plan to use	8	3	4	3.87	.354

21. Overall Use of AFL Strategies	8	4	6	4.75	.707
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TABLE 2

*Paired t-tests Comparing Prior Use to Use After Two Years of Professional Development*

Paired differences	Std. Error		t	df	Sig. (2-
	Mean	Mean			
Pair 1 Used previously - Used last year	-1.625	.420	-3.870	7	.006**
Pair 2 Used previously - Used last year	-1.875	.479	-3.910	7	.006**
Pair 3 Used previously - Used last year	-2.000	.378	-5.292	7	.001***
Pair 4 Used previously - Used last year	-1.625	.375	-4.333	7	.003**
Pair 5 Used previously - Used last year	-2.375	.498	-4.771	7	.002**
Pair 6 Used previously - Used last year	-2.000	.463	-4.320	7	.003**
Pair 7 Used previously - Used last year	-1.750	.412	-4.249	7	.004**
Pair 8 Used previously - Used last year	-1.750	.366	-4.782	7	.002**
Pair 9 Used previously - Used last year	-1.250	.453	-2.758	7	.028*
Pair 10 Used previously - Used last year	-1.750	.491	-3.564	7	.009**
Pair 11 Used previously - Used last year	-3.125	.398	-7.850	7	.000***
Pair 12 Used previously - Used last year	-1.375	.324	-4.245	7	.004**
Pair 13 Used previously - Used last year	-.875	.295	-2.966	7	.021*
Pair 14 Used previously - Used last year	-1.000	.378	-2.646	7	.033*
Pair 15 Used previously - Used last year	-1.625	.565	-2.876	7	.024*

Pair 16	-1.125	.295	-3.813	7	.007**
Used previously - Used last year					
Pair 17	-2.375	.460	-5.158	7	.001***
Used previously - Used last year					
Pair 18	-2.000	.567	-3.528	7	.010**
Used previously - Used last year					
Pair 19	-2.250	.412	-5.463	7	.001***
Used previously - Used last year					
Pair 20	-2.125	.441	-4.822	7	.002**
Used previously - Used last year					

p < .05 \*

p < .01 \*\*

p < .001 \*\*\*

TABLE 3

*Paired t-tests Comparing Use of Strategies at the End of Professional Development to Use During the Past Year*

Paired differences		Mean	Std. Error Mean	t	df	Sig. (2- tailed)
Pair 1	Used last year - Used past year	-.250	.313	-.798	7	.451
Pair 2	Used last year - Used past year	-.375	.375	-1.000	7	.351
Pair 3	Used last year - Used past year	-.125	.227	-.552	7	.598
Pair 4	Used last year - Used past year	.125	.350	.357	7	.732
Pair 5	Used last year - Used past year	.000	.267	.000	7	1.000
Pair 6	Used last year - Used past year	.125	.350	.357	7	.732
Pair 7	Used last year - Used past year	-.250	.250	-1.000	7	.351
Pair 8	Used last year - Used past year	.125	.295	.424	7	.685
Pair 9	Used last year - Used past year	-.375	.183	-2.049	7	.080
Pair 10	Used last year - Used past year	.000	.189	.000	7	1.000
Pair 11	Used last year - Used past year	.375	.183	2.049	7	.080
Pair 12	Used last year - Used past year	-.125	.227	-.552	7	.598
Pair 13	Used last year - Used past year	.000	.267	.000	7	1.000
Pair 14	Used last year - Used past year	-.125	.125	-1.000	7	.351
Pair 15	Used last year - Used past year	.000	.378	.000	7	1.000
Pair 16	Used last year - Used past year	.250	.313	.798	7	.451
Pair 17	Used last year - Used past year	.875	.549	1.594	7	.155

Pair 18	Used last year - Used past year	.750	.491	1.528	7	.170
Pair 19	Used last year - Used past year	.875	.515	1.698	7	.133
Pair 20	Used last year - Used past year	.750	.453	1.655	7	.142

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p < .05\*

p < .01\*\*

TABLE 4

*Paired t-test Comparing the Use of AFL Strategies the Year Following Professional Development and Teachers Plan to Use the Strategies in the Future*

Paired differences		Mean	Std. Error Mean	t	df	Sig. (2- tailed)
Pair 1	Used past year - Plan to use	-.500	.189	-2.646	7	.033*
Pair 2	Used past year - Plan to use	-.625	.263	-2.376	7	.049*
Pair 3	Used past year - Plan to use	-.625	.183	-3.416	7	.011*
Pair 4	Used past year - Plan to use	-.500	.189	-2.646	7	.033*
Pair 5	Used past year - Plan to use	-.250	.164	-1.528	7	.170
Pair 6	Used past year - Plan to use	-.375	.183	-2.049	7	.080
Pair 7	Used past year - Plan to use	-.375	.183	-2.049	7	.080
Pair 8	Used past year - Plan to use	-.375	.263	-1.426	7	.197
Pair 10	Used past year - Plan to use	-.250	.164	-1.528	7	.170
Pair 11	Used past year - Plan to use	-.375	.263	-1.426	7	.197
Pair 12	Used past year - Plan to use	-.125	.125	-1.000	7	.351
Pair 13	Used past year - Plan to use	-.375	.263	-1.426	7	.197
Pair 15	Used past year - Plan to use	-.625	.263	-2.376	7	.049*
Pair 16	Used past year - Plan to use	-1.125	.295	-3.813	7	.007**
Pair 17	Used past year - Plan to use	-1.500	.423	-3.550	7	.009**
Pair 18	Used past year - Plan to use	-1.250	.313	-3.989	7	.005**

Pair 19	Used past year - Plan to use	-1.500	.327	-4.583	7	.003**
Pair 20	Used past year - Plan to use	-1.500	.378	-3.969	7	.005**

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p < .05\*

p < .01\*\*