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Trends in Alternate Route to Licensure Secondary Teacher Practices

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ABSTRACT: *The purpose of this study was to determine whether a group of ARL students enrolled in a teacher preparation program at a public university would demonstrate similar or disparate challenges during classroom observations. This can identify areas of weakness for teacher educators and influence programming and course planning to better prepare ARL students. Eleven secondary STEM ARL students were observed by the same researcher in their own classrooms. Using a content analysis methodology researcher were able to identify themes from the documented observations. Several themes emerged from the classroom observations that were made. These themes include technology considerations, classroom environment, time management, and teacher/student discourse. The findings of this study are most applicable to teacher preparation programs that include ARL students as well as traditional undergraduates. Although this study focused on secondary STEM disciplines it is possible that these results will also benefit programs such as elementary education or special education. Given the well-documented teacher shortages and difficulty in attracting people to the field of secondary education specifically, this research is timely and beneficial to teacher educators that are preparing ARL students for the classroom. ARL students deserve special consideration, and their educators can incorporate these findings to maximize learning.*

Key words*: Alternate route to license, ARL, secondary education, teacher education.*

1. Introduction

The requirements of an Alternate Route to Licensure (ARL) program are typically outlined by a state's department of education. By 2005, 46 states plus the District of Columbia had an ARL program (Ng & Thomas, 2007). An ARL program allows people who already possess a bachelor's degree to begin teaching in a K-12 classroom with a minimum of preparation. The preparation may include passing scores on standardized tests and/or an intensive summer program. In many cases, once they begin teaching, the ARL teachers will take a sequence of college-level coursework over a period of time. Successful completion of this sequence of courses is required to receive a standard teaching license in their state with a typical period of three years. The length of time and coursework can vary from state to state but might include topics such as methods courses, supporting multilingual students, child development, and similar. ARL programs have risen in popularity due to teacher shortages, particularly in key areas such as secondary mathematics, science, and special education.

Advocates believe that ARL programs, "will improve teacher quality, effectiveness, diversity, and stability in some of the nation's most under-resourced schools. By recruiting high-achieving candidates who otherwise would not consider teaching, selective alternative teacher certification programs promise to improve both teacher quality and effectiveness in those schools" (Brantlinger et al., 2022, p. 1231). For an ARL program to achieve these goals the quality of the program and teaching needs to be evaluated. This paper aims

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to consider recommendations for the education of ARL teachers using observations of in-service secondary mathematics and science educators who are completing the requirements for their standard teaching licenses as part of an ARL program. These recommendations enacted by education professionals through their coursework requirements may benefit ARL teachers.

2. Literature Review

As ARL programs continue to rise in popularity, the demand for the training of these teachers has grown. In many cases, ARL programs make up a substantial percentage of the student population for education programs. However, institutions do not always consider needs that may be specific to ARL teachers. This is problematic because ARL programs were designed to staff schools and hard-to-fill areas in communities whose makeup includes a larger percentage of students of color and students from lower socioeconomic backgrounds. Additionally, ARL candidates make up a different student demographic that needs differentiated types of support to be successful. The National Center for Education Statistics (2022) found that there were differences in the ethnic makeup of these groups as well as their sex, with more people of color and male teachers represented in ARL programs as compared to traditional ones. To mitigate the growing teacher shortages and turnover, ARL programs need to be designed to help ARL teachers navigate the different classroom environments and address the needs of diverse students.

A study by Zhang & Zeller (2016) explored this very topic of teacher retention by comparing teachers who were traditionally trained and those who were part of ARL programs. They discussed how traditionally trained teachers were more likely to stay in the field noting how "long-term retention gets worse for alternative route teachers" (p. 87). Their study also showed that, "about one-fourth of teacher retention likelihood is explained by teacher preparation. It is evident that teacher preparation has a significant impact on retention; that is, teacher retention likelihood partially depends on the type of preparation teachers receive" (p. 86). Even though other factors contribute to teacher retention, teacher preparation is partially responsible for the low retention rates.

Wayman, et al. (2003) noted how traditionally trained first-year teachers and those who were prepared in an ARL program shared similar concerns during their first years of teaching. However, ARL teachers, "indicated higher levels of concern in almost every area" (p. 38). The areas of concern included classroom management and effective instruction. These two areas of concern are also reflected in the findings of this study, twenty years later. Cleveland (2003) shares recommendations extracted from ARL participants and among those recommendations the two that stand out the most are the way coursework is designed and the support services offered. ARL teachers in this study felt that, "most of the coursework, especially coursework that was not content specific, did little to prepare them for the rigors of teaching. Although most of the participants held a degree in their content area, many struggled to apply their coursework in the classroom" (p. 32). In the area of support, the participants felt they did not get adequate support, including mentorship, from the sites, faculty, and institutions. Even though ARL programs don't have control over where students work, they should encourage a system where students can find support in the form of mentorship from faculty and/or peers.

3. Context of ARL in This Study and Data Collection

The ARL teachers from this research took coursework at a public university in the western United States. At this university, undergraduate education students are enrolled in courses alongside in-service teachers completing requirements as part of an ARL program. In Fall 2021 one of the authors facilitated a secondary science and secondary mathematics methods course. Due to chronic low enrollment, these classes occur concurrently. Both courses required students to complete fifteen hours of field experience. A field experience provides an opportunity for students to spend time in a classroom observing practicing teachers and participating in the business of the classroom as permitted. The final project in the course tasked the students to teach a lesson in their field experiences, receive feedback from their cooperating teacher, and reflect on the experience. Since many of the students were in-service teachers enrolled in an ARL program they did not have a field experience placement and simply taught their regular classes, but with a colleague observing. During the last class of the semester, each student shared their findings. One student said how grateful she was for the project because it was the first time anyone had observed her teaching in a year and a half.

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The author/instructor was surprised to hear that her students, those enrolled in an ARL program, were not receiving timely feedback on their teaching from administrators or being observed on a regular basis. It was decided moving forward that she would observe all of her students currently working in a classroom and provide feedback to them.

In fall 2022 one of the authors facilitated the same secondary science and secondary mathematics methods course for the third time. Combined, there were eleven students, five in science and six in mathematics. The science students are pursuing licensure in either physical science or biology. One of the students was a traditional undergraduate, and two of the students were also traditional undergraduates, but they were completing their student teaching semester while taking this methods course in what is called a teacher residency model. In a teacher residency model, the undergraduate student teachers are the teachers of record for that class and are mentored by a veteran teacher at the campus to fulfill the obligations of the semester. These students complete their student teaching while being the lead instructor in their class. They are paid as long-term substitutes and usually fulfill vacancies for the school site. This model has been popularized as another way to mitigate the dearth of educators in the region. The remaining eight students were in-service secondary STEM teachers completing the requirements to receive their license via an ARL program. In summary, all but one of the eleven students was teaching full-time in a middle or high school STEM classroom.

The first observation occurred in late September and the last observation occurred at the end of the semester in December with eleven observations made in total. One student was observed twice. The author/instructor took notes during each visit which they then typed into a coherent document and shared with the in-service teacher within thirty-six hours. Brief comments were typically exchanged the next time the methods class met and a few lengthier meetings about the observation took place.

Having a repository of these detailed descriptions of the classroom visits, the authors of this article independently looked for trends across the observations and then met to discuss them. The following section discusses the methods used to evaluate the data.

4. Methods

To analyze the data collected from the detailed observations, a content analysis methodology was employed. Hsieh & Shannon (2005) describe conventional content analyses as, “generally used with a study design whose aim is to describe a phenomenon” (p. 1279). They further elaborate that this method allows for categories to come from the data instead of using preconceived ones. Prasad (2019) also adds that this type of analysis, “goes beyond merely counting words or extracting objective content from texts,” (p.8) but it also includes examining the data for, “meanings, themes, and patterns that may be manifest or latent in a particular text” (p.8). The focus then becomes exploring the data for meaning and patterns that emerge.

To maintain reliability and validity when employing content analysis, the authors of this study followed the stages recommended by Bengtsson (2016). By following these stages we lowered the risk of making incomplete inferences from the data. A brief summary of these stages includes; decontextualization (identifying meaning units), recontextualization (re-read and adding context), categorization (identifying groups and triangulation), and compilation (drawing conclusions) (p. 9). As part of our observation process, we also employed a respondent validation check which further validates the outcome of our study. During this process, the investigator goes back to the participants and presents the results in order to achieve agreement (p. 13). We were able to do this when the instructor met 1-1 with all of the ARL teachers to discuss the observation. The ARL teachers had access to their observation notes and further validated what happened in the classroom based on the dialogue.

Like any other methodology, content analysis also has its limitations. As Krippendorff (2004) notes, a concern with observations is that the subjects know they are being evaluated, and thus the data can be corrupted (p.41). We recognize that our ARL students were aware they were being observed, but in this case, this was something they perceived as beneficial, and were open to receiving feedback. Another concern arises with the relationship between the experimenter and the subject (p.41). We mitigated this potential validity concern in our research by including a second evaluator of the data. The second author of this paper did not work with these students, did not have access to identifying information, and had no previous contact with them. They were able to evaluate the data without having had that relationship element play a role.

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5. Trends

A typical assignment for ARL teachers includes creating a lesson plan where they give a detailed snapshot of how the lesson is organized and how it relates to the state standards. These serve as a summary of the happenings of a classroom, but there is no substitute for seeing it for oneself. The observations and notes collected in this study did reveal some commonalities across the teachers. In this section, we discuss three common trends observed, which include the division of labor between students and teachers, issues related to technology usage, and time management concerns. All of the observed teachers demonstrated, to varying degrees, a need for
support in these areas.

5.1. Distribution of Labor

One trend across all classrooms involved the unequal division of labor between the teacher and the students. There were many incidents where the teacher could have put the onus back on the students. When students asked questions in class, the ARL teachers felt it was their responsibility to answer them. However, nearly all the questions could be answered by a peer, which would then bring instruction back to focus on students and give them opportunities to practice their understanding. Questions that could be opened up to the class to consider include:

- Is this in slope intercept form?
- Are there more examples possible?
- When do we use a closed or open circle?
- What does infinite solutions mean?
- Why doesn't -2 work as a solution?
- Which line is the transversal?
- What does the prefix de- signify?
- What is homeostasis?
- What did you notice in the video?

Some other documented examples of tasks that students can assume include passing back papers, watering the plants, timekeeping, and updating information on the whiteboard. Assigning these tasks to students would help disseminate classroom responsibilities and help everyone feel like they are part of the classroom environment. With the distribution of labor, the ARL teacher would spend less time repeating themselves to the students which was a common observation from our data.

5.2. Technology in the Classroom

The second trend we observed was due to the amount of questions surrounding technologies in the classroom that the instructor noted. The ARL teachers were working at different middle and high schools across the school district. This resulted in different types of technology available in classrooms as well as different pressures to use technology. Issues related to technology included availability, reliability, security, storage, and charging. Transitions are often a consideration when lesson planning and even more so when activities involve technology. Teachers sometimes included videos in their lessons, simulations, and presentations, and their source appropriateness or value was questioned.

5.3. Time Management

Another trend was a lack of general classroom environment techniques. A lack of procedures for passing out and collecting paper as well as putting names on papers was witnessed. Obtrusive bathroom policies and unfocused lesson closures also disrupted the flow in observed classrooms. One might assume that the classroom observation of a novice teacher might include students talking out of turn and merit a conversation about the classroom environment. However, that was not the case in these observations, in fact, the opposite was true. In these observations there were several instances where the teachers interrupted students at work, confusing them with more direction and instruction. More than once students were given instructions and let loose to complete a task only to be continually interrupted by the teacher giving more directions. This occurred during written work and while students were trying to interact with media. Teachers need to protect student work time and be able to disseminate when it is appropriate to interrupt.

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6. Recommendations

ARL teachers have been put in a challenging position. They work a full-time job in the career they are learning more about during three years' worth of online and evening coursework. Like their novice, but licensed, colleagues they are navigating the challenging first years of teaching yet also doing more. Making the most of our time with these students and targeting the areas where they need the most support is a must for their instructors. The trends demonstrated in the observations made in these methods courses lead naturally to the following recommendations.

6.1. Take the Time to Observe In-Service Teachers in ARL programs

It is a commitment by university faculty to observe all the in-service teachers during a semester. Faculty are not necessarily compensated for the time and gas that is required to drive, in some cases, long distances to observe their students at work. However, making these visits provided important feedback to the in-service teachers. The students expressed gratitude for the feedback. One replied to the email, "Again, thank you for your suggestions and insights. In one visit and one email, you have provided more information to me than I received from my administration in over a year." Another wrote, "Your notes are incredible! The lesson plan you made plus the evaluation is wonderful. Even on a perfect day, I've never been that clear and precise. Thank you for being so honest and professional with your feedback. Look forward to talking with you about it next week." These classroom observations became an important part of the semester's work and a great tool for relationship building. Instead of merely listening to students talk about their campuses and classrooms the methods course instructor was able to see for themselves. If an instructor is unable to visit all their ARL teachers in a semester they can enlist their colleagues who may have the same ARL teachers enrolled in their courses. Alternatively, planning for these observations can be organized programmatically.

6.2. Time Management - Be Explicit

Nearly all the ARL teachers were encouraged to get a classroom timer and use it. We prefer a timer that is separate from a personal cell phone for a few reasons. Some teachers might not want their cell phones visible during class. In some cases, this is teachers modeling school policy regarding cell phone usage. Other teachers might be using their cell phones for other classroom purposes like assigning participation points. Another reason we eschew a personal cell phone as a timer is because the screens inevitably will time out or the battery will run low. Time management is a challenge for novice teachers in part because we are choosing activities we have never facilitated before and can only estimate how long they will take. Timers not only keep us on track but also keep students on track. Telling students they have *X* minutes to work on a task is preparing them for standardized tests because they are learning what *X* minutes feel like and what they can accomplish in that length of time. Students can also see the time passing and learn how to moderate or allocate their work time. The "buzz" of a timer also serves as an attention-getting tool that lends itself to a better classroom environment. The signal at the end of a work period communicates to students to hold for verbal instruction. In an inquiry-style, student-centered lesson student work time should be followed by discussion and synthesis and it is the facilitator's responsibility to allow time for this (Wieman & Arbaugh, 2013).

6.3. Students Working > Teacher Working

Creating a more student-centered classroom would take a lot of responsibilities off of these teachers' shoulders and give them back to the students. Chores such as watering plants, passing back papers, timekeeping, and updating the whiteboards can become student tasks. Creating assessments can also be done collectively with input from students. Reviewing past assessments and assignments can be done in small groups. Anchor charts can reduce the energy teachers spend repeating themselves and serve as a reference that lasts much longer than one class period.

The biggest area for positive change related to students at work, that is student engagement, comes in the form of discussion. Instead of answering the questions that students pose and that come up naturally in a lesson, teachers need to encourage students to answer these questions together. This might be a think-pair-share, a turn and talk, or a jigsaw. The closure of a class period should not be the teacher telling the students what they learned, but rather the students telling the teacher. Communication and collaboration are long-held expectations for STEM students (NCTM, 2000) and we are depriving them of these if teachers are not encouraging discourse opportunities. The methods course that these students were members of included the

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classic tomes, *5 Practices for Orchestrating Productive Mathematics Discussions* by Smith and Stein, and *5 Practices for Orchestrating Productive Task-based Discussions in Science* by Cartier, Smith, Stein, and Ross. The ideas contained in these texts and facilitation techniques need to be presented more explicitly. Teacher educators also need to acknowledge the reticence of novice teachers to allow students to work and talk together. This reticence may stem from the belief that allowing for discussion will take up too much class time. It might also feel uncomfortable for ARL teachers who did not learn math or science via a student-centered classroom, but rather from lecture. There are also fears tied to classroom environment concerns, therefore classroom environment should also be a topic for consideration in a methods course for ARL teachers and is included as a separate recommendation.

6.4. Technology - It's Here

ARL programs may not require a course in educational technology that traditionally trained educators are receiving in their degree programs. If this course is not taken, its essential ideas should be shared by teacher education faculty in methods courses. Observations related to technology included recommendations to use a wearable microphone in large classrooms. Another technology recommendation was to consider a handheld device that allows teachers to circulate the classroom but is still present on the interactive whiteboard. If teacher educators do not prefer the ways that ARL teachers are utilizing technology in their classrooms we need to be prepared to provide resources and more suitable alternatives. When reviewing lesson plans accommodations should be made in cases where the failure of the technology could render the lesson impossible to facilitate. This is part of creating, enforcing, and practicing procedures related to the use of technology. The use of technology also presents another opportunity to implement procedures related to their use or their prohibition in some cases. This is another area for consideration in the next recommendation.

Repeatedly when reviewing the observations we are left wondering, what is the value added of being in this classroom? After experiencing distance learning on a large scale during the COVID-19 pandemic we know what it means to assign students a video to watch and then ask them to answer questions. If teachers are choosing and playing videos for their students to watch in the classroom there needs to be a tangible, palpable benefit to being together in a classroom of one's peers. The lesson and the lesson plan should point to something students are receiving for being in the classroom. What it is they are receiving could be a discussion for a methods class. The start of an answer to the question might be found in the previous recommendation which encourages student engagement, communication, and collaboration.

6.5. General Classroom Environment

There is a tendency to believe that because ARL teachers are in-service teachers they have already established some of the daily aspects of classroom management like bathroom passes, passing out papers, and communicating instructions to students. These observations show that some discussions and options related to these classroom chores could benefit ARL teachers. ARL teachers might be adopting procedures from their colleagues that are not a good fit or even continuing procedures from their childhood. A methods course for ARL teachers should include some conversation about the procedures that allow a classroom to function smoothly. The methods course that these students were members of did a book study of Fay and Fay's classroom management classic, *Teaching with Love and Logic: Taking Control of the Classroom*, but did not include a consideration of such procedures which would have been beneficial.

7. Limitations, Conclusions, and Future Research

These observations were made by a teacher education faculty member and are certainly colored by their impressions, beliefs, and the ideas discussed during the methods course each student was a member of. Another person witnessing these same classrooms may have entirely new and different takeaways. The observations that make up this project came from teachers who were earning their licenses through participation in an ARL program, however that program was not hosted by an institution affiliated with the authors of this paper. ARL programs, although they may differ from state to state, typically do include observations from experienced educators that are trained for this work. Reasons why the teachers in this project were not receiving that kind of support from their ARL program remain unknown.

Making these observations strengthened the relationship between the university instructor and the teachers. The instructor was able to see the environment the ARL teachers were working in and the teachers

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felt their instructor cared enough to take the time to travel to the campus for the observation. Discussing the observation was an opportunity to reflect one-on-one regarding their evolution as an educator in ways specific to that student's needs.

All of the recommendations included in this paper can and should be explicitly included in a teacher preparation program, both for ARL teachers and traditionally prepared undergraduates. Due to the content requirements for secondary education students, they often receive less instruction related to education as compared to elementary education, special education or other degrees leading to licensure. A STEM methods course is the ideal time to specifically address the recommendations included in this paper alongside other critical information future teachers need to know.

It became clear when investigating related literature that very little educational research has focused on the preparation of ARL participants. Finding ways to increase the number of people pursuing education as a career and improving the effectiveness of their training are important considerations for future research. There is great potential in this for the continuation of and replication of studies that were done years ago. The popularity of ARL programs as an avenue to licensure and the impact these educators are having in K-12 classrooms make it an aspect of teacher education worthy of exploration. More research into the experiences and training of ARL students might also uncover results that will benefit traditionally prepared undergraduates.

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