SELF-DIRECTED LEARNING FOR RURAL MATHEMATICS TEACHERS

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Twenty-seven percent of American public-school teachers are located in rural areas of the country (National Center for Education Statistics, 2012), yet their professional learning needs and experiences are under-studied. Limited research has highlighted some of the particular challenges of being a rural teacher of mathematics: geographic isolation, professional isolation, and insufficient opportunities for high-quality professional learning (Royster as cited in Cady & Rearden, 2009). One strategy used to address these issues has been to form inter-district networks of faculty for purposes of professional learning, but this has been met with uneven success (Howley & Howley, 2005).

This study considers a model of teacher professional learning within a rural inter-district learning cooperative situated within economically disadvantaged Appalachia. The model utilized invites teachers to direct their own learning, by first identifying their learning needs and then requesting financial grants of up to $1,000 from the cooperative in order to realize them. Similar to Slavit and McDuffie (2013), we draw on adult learning theory to explore the individualized and self-directed nature of the participating rural teachers' professional learning experiences and examine the following research question: *How do rural mathematics teachers describe their motivation, needs, and learning within self-directed professional learning experiences?*

The authors analyzed videos of the final summative presentation from eight teachers receiving the cooperative grant. For these analyses, three broad codes from Knowles (1975) were utilized: (1) identify areas of growth (why participate), (2) finding people and resources to learn from (what is needed), and 3) evaluate the learning that they have experienced (lessons learned). Analytic memos were created for each of the three broad themes.

The reasons for participation teachers identified often reflected the situation of their practice in a rural, socio-economically disadvantaged region and/or the needs of their students as a whole. Two teachers considered the economic outlook of the region, choosing to supplement their current practice with skills that might support their students in creating or capitalizing upon emerging economic opportunities. These teachers worked to incorporate computer programming and making skills into their mathematics classrooms. The resources teachers utilized to realize their goals were largely unsurprising. Grant monies were used to purchase tools for makerspaces, laboratory materials for cross-curricular STEM units, computer science applications, and pieces of technological equipment. All teachers reported successful learning experiences. While some teachers shared unexpected learnings, such as re-imaging the use and application of educational technology, others reported constraints on learning often associated with technology adoption.

Findings from this study suggest that when rural teachers are supported in designing and self-directing their own learning, their motivation for doing so is often grounded in the needs of their students and the needs of the local community. Most of the resources purchased with the mini-grants were typical educational supplies, but some also reflected the cultural heritage of the region. While material resources were procured with relative ease, expertise was not. This was evidenced both within the constraints of technology implementation and teachers' first-time attempts to design cross-curricular content. Future research should consider the ways in which rural teachers can access and draw upon others' expertise to inform their self-directed professional learning experiences.

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