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The "Space Between": Situated Professional Development to Enhance 4-H Educators' Pedagogical Design Capacity for Effective Curriculum Enactment

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Abstract. Curricula are planned and written by curriculum developers; they serve as instructional guides for educators. Educators make adaptations to written curricula to meet learners' needs and achieve intended learning outcomes. The efficacy of curriculum adaptations is enhanced when educators have a high pedagogical design capacity, which can be improved through effective professional development. Lesson study is a model of situated professional development centered around ongoing improvement of curriculum enactment. Educators work collaboratively to make curriculum modifications and data-driven decisions to improve their teaching practices. Lesson study occurs at regular intervals over an extended duration.

INTRODUCTION

A curriculum is a tool or resource used to assist educators in instructing and advancing the learning of their intended audiences (Brown, 2009; Davis et al., 2014; Deng, 2013; Roth, 2014; Smith et al., 2017; Stein et al., 2007). Key components of any written curriculum include organized content, learning objectives, pedagogy, assessment opportunities, and evaluation. The development and use of effective curricula are important to advance the goals of schools (Davis et al., 2014) and nonformal education programs like 4-H (Smith et al., 2017).

Vensky (1992) describes a broad framework for curriculum development: the *curricular chain*. It includes a progression of actions beginning with describing and planning curriculum materials and proceeding to writing and enacting the educational resources. There are numerous models in the literature to help guide the specifics of the curriculum development process (e.g., Smith et al., 2017; Taba, 1962; Tyler, 1949, 1977; Wiggins & McTighe, 2005). Although these models differ in their details, each proceeds systematically from *planned,* to *written,* to *enacted* curriculum. As a focal point of this article, we will discuss curriculum enactment as an intentional, design-based endeavor to adapt a written curriculum to an audience.

Educators use curriculum materials to design instructional events aimed at achieving desired learning objectives. We describe curricula that include educator supports (e.g., key content, developmental appropriateness, materials needed, and pedagogical recommendations) as e*ducative.* They can help improve educators' abilities to craft instructional events by making modifications to written materials that aid in meeting learners' needs and adapting to the context in which they are being taught (Davis et al., 2014). However, educative curricula have limitations, and it is important that educators who are charged with enacting them also engage in associated professional development that includes educator reflection and discourse (Davis et al., 2014; Darling-Hammond et al., 2017).

Effective professional development is situated within authentic educational contexts, is collaborative, comprises successive events over an extended period, involves educator reflections, and is predicated on dialogue among participants (Brown, 2009; Darling-Hammond et al., 2017; Kubitskey & Fishman, 2006; Lieberman & Pointer Mace, 2010; Lave & Wenger, 1991). As one example, lesson study is a model of situated professional development that involves groups of educators working collaboratively to improve curriculum enactment and learner outcomes. The approach engages educators in data-driven decision making based on teaching and learning and occurs incrementally over an extended period of time (Lewis & Hurd, 2011). Lesson study has been effective with 4-H staff, adult volunteers, and teen volunteers (Schmitt-McQuitty et al., 2019; Smith, 2013).

THE CURRICULUM AND CURRICULUM DEVELOPMENT

THE CURRICULUM

Although the term "curriculum" is often poorly articulated in the literature (Jackson, 1992; Smith et al., 2017), it is generally understood to be a tool or resource that helps educators guide instruction (e.g., Jackson, 1992; Stein et al., 2007). Used as an instructional resource, a curriculum can introduce novel ideas and methods that help educators achieve goals they could not realize in its absence (Brown, 2009). Engaging educators with innovative activities and methods can help them achieve intended learning outcomes and influence their teaching practice. Therefore, a curriculum requires careful attention to design elements during its planning and development to accommodate the intended audience (Brown, 2009).

Smith et al. (2017) provided "an operationalized definition of curriculum that can be used in the development of new curricula or adaptation of existing curricula" (p. 1, para. 3). Specifically, the authors referred to a curriculum as an educational resource made up of a progression of learning experiences that include measurable learning objectives, an organizational style in which concepts build upon one another over time (*vertical sequencing*); content connected to authentic issues or situations (*horizontal sequencing*), and a developmentally appropriate approach based on the intended audience. They also emphasized the importance of pilot testing and outcome data collection to help ensure a curriculum's efficacy relative to achieving intended outcomes.

CURRICULUM DEVELOPMENT BY DESIGN

Wiggins and McTighe (2005) stated that high-quality curriculum enactment is reliant upon a well-designed curriculum. It is important that curriculum developers be mindful of the critical design elements, referred to by Schwab (1983) as *commonplaces* of education, that include content, attributes of learners, learning context, and pedagogy. We must consider each of these design elements during the curriculum development process to produce a resource that engages educators and helps achieve learning outcomes with intended audiences. Recent publications representing several disciplines in K-12 public schools and at universities have placed a focus on diversity, equity, and inclusion (DEI) when developing educational resources and programming (e.g., Endo, 2021; Greene & Paul, 2021; Hagman, 2021; Ibe et al., 2018; Lieutenant & Inge, 2017; Lupton et al., 2020; Speed et al., 2019). Thus, we also recommend that curriculum developers include DEI as an important fifth commonplace (Figure 1).

The existing literature presents numerous curriculum development models (e.g., Smith et al., 2017; Taba,1962; Tyler, 1949, 1977; Wiggins & McTighe, 2005). Regardless of the model, however, the approach to the design of curriculum materials must be an intentional process that progresses systematically. It is useful to frame the development along a curricular chain (Venezky, 1992) that begins by describing a specific need and follows that need with effective planning (the planned curriculum). The curriculum planning process includes—but is not limited to—the identification of intended audiences, relevant content, learning goals and objectives, acceptable evidence of learning, pedagogy, discrete learning experiences and their organization (e.g., sequence), frameworks and guidelines (e.g., state, national, organizational), and supplementary resources (Bobbitt, 1918; Harden & Stamper, 1999; Smith et al., 2017; Taba, 1962; Tyler, 1949, 1977; Wiggins & McTighe, 2005). The planned curriculum then serves to guide curriculum developers in the generation of the written curriculum, the resource that educators will implement (the enacted curriculum) with their intended audiences (Venezky, 1992; Wiggins & McTighe, 2005).

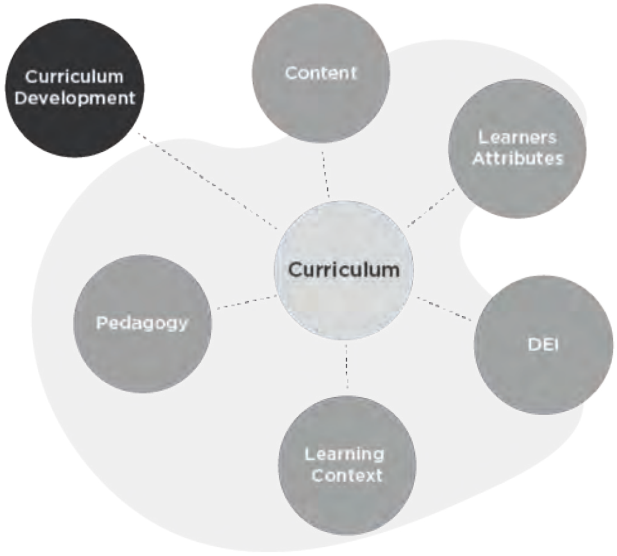

Figure 1. "Commonplaces" of curriculum development; as established by Schwab (1983).

THE EDUCATIVE CURRICULUM

When engaging in curriculum development, it is imperative that the resulting written resource also promotes educator learning and expands their knowledge base (Davis & Krajcik, 2005; Davis et al., 2014). Referred to as an educative curriculum, such a resource helps educators advance different knowledge domains including content, pedagogy, and pedagogical content knowledge (Davis et al., 2014). To accomplish this, curriculum developers must incorporate educative features into their design. These features may

include but are not limited to: subject matter, pedagogical supports and recommendations, enactment strategies, narratives or vignettes, and assessment practices. From an applied perspective, educative curriculum resources help educators improve their *pedagogical design capacity*, which refers to their ability to perceive "the affordance of [curriculum] materials and [make] decisions on how to use them to craft instructional episodes that achieve" desired learning outcomes (Brown, 2009, p. 29).

CURRICULUM ENACTMENT

CURRICULUM ENACTMENT BY DESIGN

Curriculum enactment refers to implementing a written curriculum with specific intended audiences (Venezky, 1992), where educators are the primary contributors to the quality of the enactment (Borden et al., 2014; Brown, 2009). From a practical perspective, the written curriculum provides an instructional framework; however, the written curriculum is a static document that "comes alive" only through interpretation and enactment by educators (Brown, 2009, p. 22). Educators make modifications to help improve enactment, thus helping to increase the likelihood of achieving the intended learning outcomes (Remillard, 2018). In this way, the enacted curriculum represents the manifestation of a flexible relationship that exists between the educator and the written curriculum (Brown, 2009; Remillard, 2018; Roth, 2014).

Similar to curriculum development, curriculum enactment is a design-based endeavor. To address design elements for curriculum enactment with specific audiences in diverse learning contexts, educators make intentional modifications to curriculum resources (Remillard, 2018). However, we must plan modifications to the written curriculum carefully. Design elements educators must consider when making modifications for effective enactment are similar to those of curriculum developers, namely the commonplaces: content, learners, learning context, pedagogy, and DEI. The most common types of modifications to the written curriculum made by educators include:

- *Offloading,* whereby educators rely principally on the written curriculum or portions therein (e.g., worksheets, question prompts, specific tasks),
- *Adapting,* which involves educators using some parts of the written curriculum for implementation but adapting other portions to better accommodate the needs of the learners or the context, and
- *Improvising*, for which educators develop enactment strategies that differ from the written curriculum but remain true to the intended learning objectives (Brown, 2009).

CURRICULUM MODIFICATIONS AND PEDAGOGICAL DESIGN CAPACITY

Brown (2009) compared a written curriculum used by educators to the sheet music used by musicians. A written curriculum is inert; educators bring it to life through enactment. Similarly, sheet music is static, and musicians bring it to life through their interpretation and performance. Although design considerations—such as style, tempo, and instrumentation—by different musicians will lead to different renditions of the same score, the experience level and skills of the musicians will also affect the modifications and performance (Brown, 2009). Correspondingly, the experience level and pedagogical design capacity of educators who make design-based decisions around instructional resources will influence modifications to the written curriculum and subsequent curriculum enactments.

Pedagogical design capacity represents an educator's ability to make effective modifications (design decisions) to help meet the intended outcomes of a written curriculum (Brown, 2009). Educators with high pedagogical design capacity have an enhanced ability to modify a curriculum in productive ways that correspond to their learners and the learning context (Brown, 2009). Remillard (2018) stated that improved pedagogical design capacity influences the "quality of instruction" by affecting educators' "ability to interpret, make decisions about, and leverage the resources in" a curriculum (p. 484). Furthermore, situated professional development that engages educators in "specific features and affordances of curriculum materials and [supports them] in making necessary design modifications" can be beneficial in advancing their pedagogical design capacity (Brown, 2009, p. 33).

SITUATED EDUCATOR PROFESSIONAL DEVELOPMENT

A well-developed educative curriculum is important in advancing educators' skills and achieving desired learning objectives with intended audiences. However, an educative curriculum has limitations, including the quality of the resource; educators' prior knowledge, beliefs, and dispositions; the restricted breadth of the materials; and the improbability that the resource will meet the needs of all educators (Davis et al., 2014). Thus, we recommend that other forms of educator support, including *situated professional development*, be used with educative curriculum materials.

We can improve pedagogical design capacity and the quality of curriculum enactment when educators engage in professional development that is reflective, situated within an authentic context, predicated on dialogue, and data-driven (Brown, 2009; Darling-Hammond et al., 2017; Kubitskey & Fishman, 2006; Lave & Wenger, 1991). Situated professional development also helps educators make informed

modifications to lessons while maintaining the original goals of a curriculum (Kubitskey & Fishman, 2006). Other characteristics of situated professional development include being recursive over an extended duration, supporting collaboration, and emphasizing connections to—and being informed by—the written and the enacted curriculum (Darling-Hammond et al., 2017; Kubitskey & Fishman, 2006).

Lieberman and Pointer Mace (2010) have advocated for professional development models that use Communities of Practice—groups of individuals engaged in collective inquiry and reflection (Wenger et al., 2002)—to engage educators in the discourse of teaching. Participation in the discourse of teaching aids educators in achieving the desired learning objectives put forth in a curriculum by helping them further advance their knowledge and skills (Borko, 2004; Brown, 2009; Davis et al., 2014; Lieberman & Pointer Mace, 2010).

LESSON STUDY

Lesson study is a model of situated professional development for educators that is centered on ongoing enhancement of curriculum enactment and, congruently, continued improvement of learner outcomes (Lewis & Hurd, 2011). The lesson study process involves educators working collaboratively in Communities of Practice where they take an inquiry stance on their practice through discourse and reflection and engage in making data-driven modifications to both a written curriculum and their own teaching practices (Lewis et al., 2004). Lesson study occurs at regular intervals over an extended duration.

The lesson study process is cyclic. Educators prepare and implement an individual instructional event, collect formative data (e.g., observations, artifacts) during enactment, reflect upon the experience during a subsequent lesson study group meeting, and plan a successive instructional event with their intended audiences (Lewis & Hurd, 2011). Thus, the space between enactments (i.e., each lesson study group meeting) (Takahashi, 2020) is where formative data are presented and reflection and discourse occur; it is where data-driven modifications to curriculum materials are deliberated and realized, and it is where subsequent instructional events and enactments are discussed and planned. Through reflections and discourse, this "space between" is also where educators' pedagogical design capacity is applied and further developed.

Schmitt-McQuitty et al. (2019) summarize one example of the effective use of lesson study in 4-H. Specifically, 4-H teens as teachers engaged in lesson study for the delivery of a nutrition education program with younger youth. Following the lesson study cycle (Figure 2), the teen educators met to plan their first implementation by adapting the curriculum content to meet the developmental needs (learner attributes) of their intended youth audience; additionally, through group dialogue, the 4-H teen educators considered pedagogical modifications, the learning context, and DEI factors necessary for delivering the education content effectively. After each curriculum enactment, the group discussed outcomes from formative data informed by educator reflections (plus-delta tables; see Figure 3) during lesson study group meetings. When necessary, the educators made additional curriculum or pedagogical modifications to help youth achieve the desired learning outcomes. Schmitt-McQuitty et al. (2019), Smith et al. (2021), and Smith (2013) present additional examples of the effective use of lesson study in 4-H.

Figure 2 demonstrates the iterative nature of lesson study and the "space between" curriculum enactments.

Figure 3 portrays the plus-delta educator reflection tool for 4-H curriculum implementation (Schmitt-McQuitty et al., 2019).

DISCUSSION AND IMPLICATIONS

Venezky's (1992) curricular chain refers to a sequence of events that moves from the planned, to the written, to the enacted curriculum. We emphasized, however, that the written curriculum is not what is actually enacted in real-world settings (Remillard & Heck, 2014). Rather, what is enacted is a version of the written curriculum that has been modified by educators to address local factors. Referred to as an educator-intended version of the written curriculum, what is enacted "has more texture and details" and "is designed for specific [learners] at a particular moment in time" (Remillard & Heck, 2014, p. 711).

In the 4-H Youth Development Program, curriculum materials are foundational to successful programming (Smith et al., 2017). 4-H educators who interact with written curriculum resources rely on them to provide relevant content, intended practices, and other critical design elements when planning for enactment. Understanding that the enacted curriculum is a human endeavor (Prideaux, 2003), improving 4-H educators' pedagogical design capacity is essential to helping them make effective interpretations and modifications of written curriculum materials. To accomplish this, situated professional development centered around reflective practice and dialogue is imperative (e.g., Brown, 2009; Darling-Hammond et al., 2017).

Lesson study is a model of situated professional development focused on improving curriculum enactments through data-driven decision-making based on educators' reflections and dialogue (Lewis & Hurd, 2011). However, most professional development opportunities for 4-H educators involve isolated offerings such as workshops or seminars, most of which are largely ineffective at influencing practice (Smith et al., 2017). Smith et al. (2017) have promoted "shift[ing] the types of professional development available to 4-H educators" (para 20) to include approaches like lesson study—a model that has an extensive history of

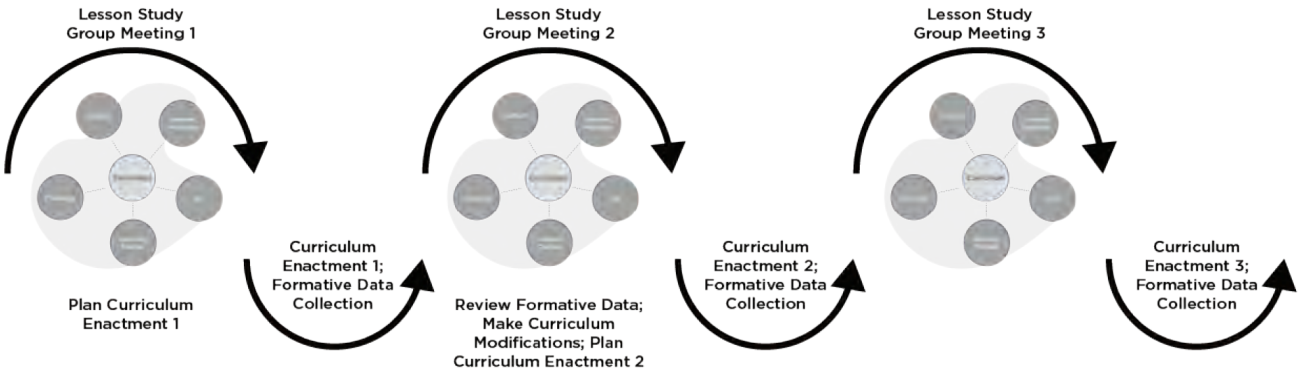

Figure 2. Lesson Study cycle.

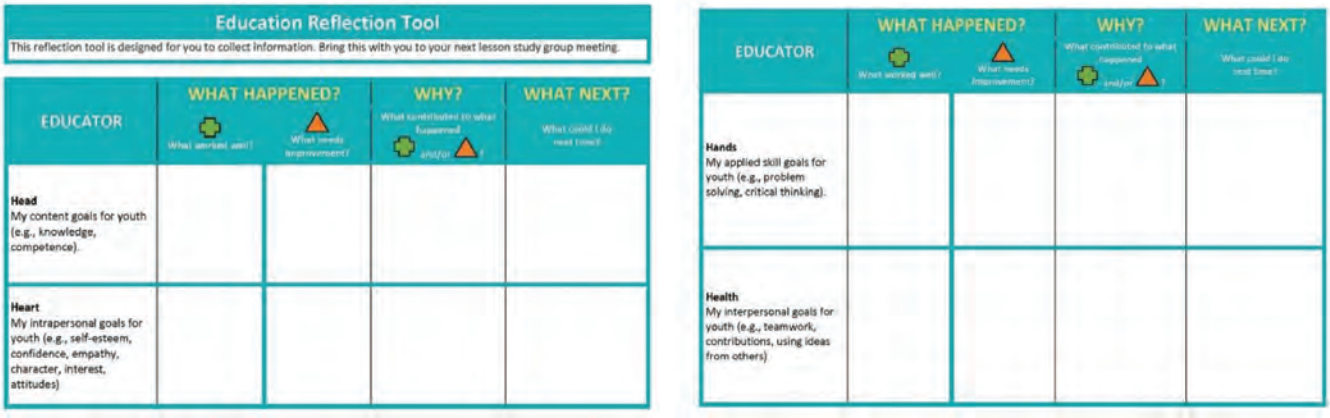

Figure 3. Educator Reflection Tool.

success as a situated professional development strategy in formal education settings (e.g., Lewis & Hurd, 2011; Lewis et al., 2004; Rock & Wilson, 2005; Wiburg & Brown, 2007).

Three interrelated theories help explain the relevance that lesson study has to the 4-H Youth Development Program: constructivism, reflective practice, and situated learning (Rodriguez et al., 2013; Schön, 1983; Wenger, 1998). 4-H programming is predicated on a "learn-by-doing" approach that is grounded in experiential learning (Borden et al., 2014). As a pedagogical strategy, experiential learning includes a concrete experience involving active exploration, a period of reflection where experiences are processed, and the application of new knowledge to help deepen and broaden understanding (Enfield et al., 2007). Specifically, 4-H youth:

1. Construct knowledge through programming that involves direct experiences in a variety of subject areas (e.g., STEM, healthy living, civic engagement, or college and career readiness)
2. Reflect on their experiences to develop an understanding of concepts relevant to the subject matter, and
3. Apply new learning to authentic situations that often have connections to their communities.

For educators to learn to implement constructivist-based programming effectively, "they must encounter multiple experiences with it as learners themselves" (Dantonio & Beisenherz, 2001, p. 14). When we provide 4-H educators with opportunities to engage in lesson study, they develop an understanding of constructivist-based pedagogy through experiential learning through their own experience. Working in lesson study groups, educators plan and implement a lesson for 4-H youth (experience), they collect formative data during and after lesson implementation and reflect upon that information during a subsequent lesson study group meeting (reflection), and they plan and implement the next lesson based on their data interpretations (application)

(see Figure 2). Thus, educators develop an understanding of constructivist-based teaching and learning through their own situated experiences in authentic contexts.

Over the past decade, the California and national 4-H Youth Development Programs have introduced lesson study to the landscape of non-formal education (e.g., Schmitt-McQuitty et al., 2019; Smith, 2013; Smith et al., 2021). Results from these studies reveal positive outcomes relative to 4-H educators' knowledge and skills, lesson planning, reflective practice, data-driven decision-making, content knowledge, pedagogical knowledge, teaching practice, and social connections. Thus, there is potential for the model to help effect change in 4-H educators' practices.

To these ends, we propose taking a more strategic approach to the development and use of curriculum materials in 4-H. Specifically, we recommend "lengthening" Venezky's (1992) curricular chain by purposefully connecting the planned, written, and enacted curriculum to educator professional development using lesson study. By viewing 4-H programming through this broader, more holistic lens, curriculum development, curriculum enactment, and educator professional development would not be regarded in isolation; rather, they would be considered along an interdependent continuum of events. This change could help advance the knowledge and abilities of 4-H educators—as well as strengthen 4-H programming.

CONCLUSION AND RECOMMENDATIONS

Based on previous research that demonstrates the efficacy of lesson study in 4-H, we advocate for the ongoing use and expansion of lesson study in 4-H by linking it—intentionally and systematically—to the curricular chain. Lesson study meetings occur at intervals over time and represent the "spaces between" the written curriculum and the enacted curriculum. Participating educators work collaboratively through discourse and reflection and engage in data-driven decision-making on curriculum modifications and their own teaching practices. Through reflection and discourse that occur during lesson study group meetings, 4-H educators can improve their pedagogical design capacity, thus improving their abilities to make effective design-based decisions that enhance learning experiences for 4-H youth audiences. As a result, we would increase the likelihood of achieving the desired learning outcomes for 4-H youth set forth in written curriculum materials.

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