Evaluation of an SCCT-Based Intervention to Increase Postsecondary Awareness in Rural Appalachian Youth

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Abstract

Students underrepresented in higher education often require unique support throughout their career and college planning. Rural Appalachian youth characterize a large population of underrepresented students. This article describes a theory-based multiweek career education curriculum aimed at increasing career and college readiness that was delivered to over 1,300 high school students in two rural Appalachian counties. Evaluation data from 867 of these students, as well as from the program staff, are provided. Findings suggest that participants found the intervention useful, learned new information about postsecondary planning and career exploration, and received assistance planning for their futures. Implications for school-based career education with underrepresented students, in general, are discussed.

Keywords

career readiness; career education; college readiness; rural

Career and college readiness are integral parts of the K–12 school experience, and school, career, and academic counselors play a critical role in preparation for postsecondary success. For example, the American School Counselor Association (ASCA, 2012) recommended school counselors address college and career readiness within a comprehensive school counseling program. Utilizing core curriculum instruction provides an opportunity to present all students with information about postsecondary options and build skills and awareness to increase success. One group of students that may need specialized programming on career and college readiness is rural Appalachian youth. The Appalachian region consists of 205,000 square miles of land extending from southern New York to northern Mississippi (Pollard & Jacobsen, 2017). The region includes 420 counties across 13 states, meaning that many school and career counselors are working in rural Appalachian schools. This article provides an overview of the unique needs of rural Appalachian students and offers a theory-based intervention to increase career and college readiness for this population.

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Rural Appalachian Youth

The Appalachian region has been described as having a rich and diverse culture, consisting of persisting aspects of "folk heritage" and influences of modern America (Obermiller & Maloney, 2016). This area of the United States is generally more rural and faces greater socioeconomic disadvantages than the broader nation, and those parts of Appalachia that are rural often face particularly high levels of distress (Pollard & Jacobsen, 2017). The sociocultural and geographic environment of rural Appalachia presents unique challenges for this population as they navigate educational and vocational pursuits, including low socioeconomic status, long travel times to school, inadequate education, and unemployed parents, placing students of these regions in disadvantaged positions for achieving educational goals (Pollard & Jacobsen, 2017).

Rural Appalachian counties demonstrate continued disparities in poverty, unemployment, and high school graduation rates. High school completion rates in many of these counties remain near 70% compared to the national average of 86.3%, and unemployment rates are often 1.5 times the national average or more (Pollard & Jacobsen, 2017). Similarly, Pollard and Jacobsen (2017) reported that the majority (74.4%) of Appalachian adults over the age of 25 obtained no form of postsecondary education. Therefore, many of these youth would identify as prospective first-generation college students (PFGCSs) or students who have not yet graduated and whose parents have no formal education beyond high school (Gibbons & Borders, 2010). PFGCSs report greater perceptions of barriers, including finances and lack of academic preparation, lower college-going self-efficacy, lower positive outcome beliefs toward college-going, and are more likely to report plans to enter the workforce after high school than their non-PFGCS peers (Gibbons & Borders, 2010; Gibbons, Borders, Wiles, Stephan, & Davis, 2006).

Career and college readiness for rural Appalachian youth

The emerging studies of this population yield interesting but sometimes conflicting results. Ali and Saunders (2006) found that rural Appalachian high schoolers connected perceptions of parental support to their career and college plans, emphasizing the importance of family as a value for these students. A later study (Ali & Saunders, 2009), however, found career aspirations were predicted by career self-efficacy and outcome expectations but not perceived support from family and friends. Brown, Copeland, Costello, Erkanli, and Worthman (2009) highlighted the importance of college-educated role models in their study on educational outcomes in Appalachian communities. They learned that students, especially boys, who were exposed to college-educated adults were more likely to plan to attend college themselves. In their study of rural Appalachian high school students, Carrico, Matusovich, and Paretti (2017) noted that interest did not always connect to career choice, often because of the influence of family beliefs or desires. Additionally, career choice was strongly influenced by the desire to stay local for those with longer family ties to their local community, highlighting the importance of localism. Rural Appalachian middle school students reported that academic motivation and positive peer relationships were directly related to higher academic achievement (Hoffman, Anderson-Butcher, Fuller, & Bates, 2017). Also, Wettersten et al. (2005) found that self-efficacy, outcome expectations, and

perceived supports and barriers strongly predicted attitudes about school engagement and that parents strongly influenced career and college plans for rural Appalachian youth. It appears family likely influences career and college planning, students need college-educated role models, and believing in their ability to complete the tasks needed to enter into and complete college are vital components for rural Appalachian youth. One theory that directly addresses all of these components is social cognitive career theory (SCCT; Lent, Brown & Hackett, 1994).

SCCT

SCCT (Lent et al., 1994) is one of the most widely researched theories of how individuals develop career-related interests and goals. Specifically, interest in and intentions to pursue various career paths are predicted by barriers and supports in the immediate environment, beliefs that the individual can successfully pursue those paths and that doing so will have benefits. These self-efficacy beliefs and outcome expectations are predicted by individual differences (e.g., in ability, gender), learning experiences, and barriers and supports. Thus, research (e.g., Ali & Saunders, 2006, 2009; Brown, Copeland, Costello, Erkanli, & Worthman, 2009; Wettersten et al., 2005) and theory predict that students who are exposed to college-going role models, who have opportunities to learn about postsecondary educational options, and who are given tools to overcome barriers to postsecondary education should experience greater confidence in their abilities to pursue postsecondary education, greater beliefs in the value of postsecondary education, and thus greater interest in actually going to college.

To address potential barriers experienced by rural Appalachian youth, a multicomponent program grounded in SCCT was developed as part of a National Institutes of Health-funded Science Education Partnership Award. This program considered the cultural needs of this population and sought to increase postsecondary education and science, technology, engineering, math, and medical science (STEMM) awareness. In this article, we describe the classroom career education component of the program and offer evaluative evidence regarding its feasibility and value.

The Program

Possibilities in Postsecondary Education and Science (PiPES) is a multifaceted program developed to increase interest in postsecondary education, in general, and STEMM, in particular, for rural Appalachian students. Developed by the first and second authors, PiPES program components include classroom-based career education, a 3-day summer camp at a southern public university, student leadership training, family information sessions, and collaboration with school and community stakeholders. The classroom-based career education component, which is the focus of this article, is delivered to high school students through multiweek classroom guidance lessons.[1] These lessons aim to raise postsecondary awareness and knowledge, reduce perceived barriers, connect student goals to postsecondary options, and introduce career options in STEMM. All students in targeted grade levels

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[1.]See https://tiny.utk.edu/PiPES Manual for full curriculum.

receive the 6-hr (360-min) multiweek classroom intervention, delivered either as eight 45-min or six 60-min lessons, depending on school preference.

Classroom-based career education components—As will be described below, the PiPES classroom curriculum is grounded in SCCT, implemented through a culturally informed lens. On the surface, program components may not appear to be specific to rural Appalachia. The PiPES curriculum is grounded in SCCT and principles of effective career education and as such focuses on reducing proximal barriers and increasing supports, increasing self-efficacy, raising outcome expectations, exploring self and the world of work, and so on—aspects likely to be included in effective career education with any group. However, the specific ways in which these activities are discussed with students and the lens through which these activities are understood by our staff is culturally specific. Indeed, the entire premise of the PiPES program is culturally informed: in a population with historical, cultural, and systemic barriers to postsecondary education, attempts to increase interest in STEMM without first increasing interest in postsecondary education are unlikely to be successful. Thus, whereas many funded programs designed to increase the diversity of the STEMM workforce focus on immersive STEMM experiences for students, PiPES is culturally specific, and thus unique, because of its focus on career education and fostering postsecondary education.

In planning activities, we paid special attention to the unique context of rural Appalachian youth, including strong connection to their local communities and family, lack of college-educated role models, possible PFGCS status, and lower college-going self-efficacy. We emphasize the ways in which biomedical, behavioral, and clinical research sciences can help remedy health inequalities in rural Appalachia, as well as highlight the fact that STEMM careers represent a large portion of the available jobs in these rural communities (Peterson, Bornemann, Lydon, & West, 2015); thus, STEMM careers might allow students to stay in and help their local communities. In addition, we encourage all types of postsecondary education, not just 4-year college. Because military service is particularly highly valued in many Appalachian communities, we also emphasize the ways in which students can pursue postsecondary training in the military. Finally, although the program is designed to address inequalities many students in this region face, we also explicitly train our intervention leaders to be aware of the many ways in which rural Appalachia is a traditionally stigmatized and stereotyped community and to take a strengths-based approach throughout the curriculum. Table 1 provides an overview of the 6-week version of the curriculum and description of how each activity relates to SCCT constructs; a brief description of each SCCT-grounded lesson and an explanation of at least one activity from each week within the 6-week curriculum format is provided below. As we describe specific aspects of the curriculum below, we will highlight additional ways in which these components are conceived or operationalized in culturally specific ways.

Week 1—We introduced the PiPES program within students' cultural context, acknowledging the health inequalities in the region, the ways in which STEMM careers can allow students to help their communities, and our goals of helping students find educational and career paths they are excited about *and* that keep them connected to their families and

homes. Introductory and goal-setting activities began to address the SCCT variables of self-efficacy, outcome expectations, supports and barriers, interests, and goals/aspirations. For example, students completed a *My 10-Year Class Reunion* activity sheet to imagine potential career, personal, and postsecondary accomplishments to tell friends at their 10-year high school reunion. They completed sentences such as "the job I want in 10 years is" and "the thing I will be most proud of by then is." Following this activity, students engaged in a discussion of success and potential steps to make their dreams come true. Although these are common activities in many cultural contexts, our staff were trained to listen for and highlight themes of localism, family and community, and lack of information about opportunities and career possibilities. For example, our staff explicitly asked about how success is defined in students' families, not just how the students individually defined success. In discussing the activity, students commonly mentioned uncertainty about what kinds of careers are possible for them, the importance of being able to support family members and stay connected to their home communities, and limited job opportunities available in their communities.

Week 2—The goal of this week was self-exploration designed to increase self-efficacy, reduce barriers and increase supports, and help develop interests and goals. Students completed an activity in pairs or small groups to help them identify personal strengths or important values through discussion of childhood heroes or of positive childhood experiences and the characteristics they exemplified. Students were provided with a worksheet to facilitate their thinking and discussion,[2] and team members circulated throughout the activity to offer encouragement and guidance as needed, before students came back together to share common themes in the larger group and engage in brief discussion about how this self-exploration informs career exploration. Students then participated in a *Career Party* activity (generally attributed to Bolles, 1990) to identify personality traits and interests. Six stations corresponding to the Holland Codes (Holland, 1997) were positioned around the classroom, and childhood toys were used to help provide visual representations of interests. For example, the artistic station included toys such as paint and musical instruments, and students who identified as creative or innovative selected this group. The activity resulted in a three-letter Holland (1997) realistic, investigative, artistic, social, enterprising, conventional (RIASEC) code.

Week 3—Students met in their school computer lab to participate in online career exploration designed to address all five SCCT constructs included in Table 1. Using the Career Party codes determined in Week 2, students were introduced to Holland Codes that related to career preferences for work experiences. Students were provided a list of STEMM careers sorted by Holland Code (Holland, 1997) and used this list of STEMM careers to facilitate career searches using an online database (www.onetonline.org). Careers represented all educational levels to appeal to our students. We used the *Interests* advanced search feature on O*Net to connect the Holland Code activity to their career search. Students completed a career research worksheet while conducting their online search, where they were asked to determine education and training requirements and describe the main responsibilities of the occupation.

[2]·Copies of all worksheets are available in the curriculum manual; see Note 1 for link.

Week 4—The goals of this week were to address contextual affordances to postsecondary education and success and to increase awareness of postsecondary options and college-going self-efficacy. We discussed multiple barriers to postsecondary education that might be relevant to rural Appalachian youth (e.g., finances, family support, location, academic readiness) and helped identify supports for addressing these barriers. Knowing that many of our students would be PFGCSs, and that lack of information about postsecondary education is a common barrier throughout the region, we also introduced them to postsecondary options and college lingo. Students were introduced to terms such as *major, credit hour, tuition*, and *financial aid*. To reinforce their learning, we played a college lingo game using college-going vocabulary. Students were divided into two teams and alternated having a teammate provide clues to help them guess a college lingo term without saying key terms. For example, students tried to get teammates to guess the term "syllabus" by describing it as a document provided the first day of class that lists assignments and dates for exams.

Week 5—The goal for Week 5 was to increase STEMM interest by connecting postsecondary options to public health needs in local communities, drawing on cultural values of localism and community. Sample activities included a *Draw-A-Scientist* activity, in which students drew a picture of a scientist and wrote five words about what a scientist looks like and five words about what a scientist does. Typical drawings included men with "crazy hair" wearing lab coats and glasses, working in isolation. This activity provided opportunities to challenge stereotypes of scientists and introduce a personalization of self as scientist. Other activities included discussion of video clips portraying research as exciting and relevant, as well as how public health issues faced by their friends and family related to possible STEMM careers.

Week 6—The final week of the program provided an opportunity for students to create a plan for reaching academic and postsecondary goals and to collect program evaluation data. This included time for answering lingering questions about postsecondary education and STEMM careers, completing and discussing a *Putting It All Together* activity sheet, and administering instruments for data collection. The *Putting It all Together* activity had students list three potential career goals, identify how these careers connect with family or community values (an intentional inclusion to reflect the culturally interdependent context in which most of these students make career decisions), and check a list of recommendations for potential behaviors throughout high school that can facilitate accomplishing these goals. This list of recommendations included items such as *take a leadership role in a club or activity*, *start a list of potential training programs or colleges,* and *register for a foreign language if planning to attend a 4-year college.* All recommendations were grounded in what was already available and encouraged at their school.

Program changes—Based on feedback after the initial year of interventions, we made some minor adjustments to the program before Year 2. We did not change the curriculum content, but we incorporated differentiated instruction. For example, we created an advanced career exploration research form used on Day 3 that provided a more detailed career search for academically advanced students. We added strategies such as polling students on Day 1 about postsecondary plans to target discussions each week, focusing more on college as a

postsecondary option than apprenticeships and technical schools in academically advanced classes where there were a higher number of students planning to attend 4-year college, and incorporating more small group discussion. We also adjusted scheduling for the intervention by offering each school a 6-week or 8-week curriculum option.

Method

Participants

PiPES was implemented in three high schools in rural Appalachian communities in two Tennessee counties. The Appalachian Regional Commission (ARC, 2016) identified the counties targeted by PiPES as economically distressed. The distressed county designation indicates low per capita income and high rates of poverty and unemployment (Appalachian Regional Commission [ARC], 2016). The students in these schools were 99% White and had below average ACT scores (average of 17.5; state average was 19.6). Postsecondary education rates in these counties were below state averages, with an average of 52.5% in one county and 49.1% in the other county.

Student participants—School 1 was our largest participating high school with 1,317 students, of whom 60.7% were economically disadvantaged; just over half (~55%) were female and the vast majority (97%) self-identified as non-Hispanic White. Both years of the intervention at School 1 were delivered to 10th-grade students, approximately 350 students each year. Of these students, approximately 23% were prospective first-generation college students (defined as students for whom neither parent had any postsecondary education at all, not even a semester of community college), 52% could be categorized as nonprospective first-generation college students, and the remaining and 25% could not be categorized because they were unsure of their parents' educational attainment. School 2 was located in the same county as School 1, with a total enrollment of 387 students. This school had the highest poverty rates of our targeted schools, with 73.9% of students who were economically disadvantaged; gender was nearly equally split. The Year 1 intervention was delivered to approximately 100 eleventh-grade students, and Year 2 intervention was delivered to approximately 85 tenth-grade students. Approximately 43% of students were prospective first-generation college students, another 40% were not, and the remaining 17% could not be categorized. Approximately 98% self-identified as non-Hispanic White. Finally, School 3, located in a neighboring county, had an enrollment of 815 students, of whom 57.4% were economically disadvantaged. Year 1 intervention was delivered to approximately 215 eleventh-grade students, and Year 2 intervention was delivered to approximately 220 tenth-grade students; approximately 54% were male, 96% self-identified non-Hispanic White; and approximately 40% were prospective first-generation college students, and approximately 43% were not. Across the 2 years and three schools, the intervention was delivered to approximately 1,320 students. As part of the larger longitudinal study on the intervention and its effect on students, we delayed implementation of the intervention until Year 2 at two of the schools to create well-matched comparison groups. This will allow us to compare outcomes for students who did and did not receive the intervention.

Project staff participants—Graduate and undergraduate students from the university delivered the multiweek curriculum in teams of two or three. We intentionally recruited students from rural Appalachian backgrounds to serve as near peer role models. Over the first 2 years of the project, 7 doctoral students from counselor education and psychology degree programs served as team leaders (including the third, fourth, and fifth authors), 6 master's students studying School Counseling and Clinical Mental Health Counseling, and 11 undergraduate students majoring in Psychology or Child and Family Studies also participated in the project. This included 11 project staff divided into four teams in the first semester of Year 1, 12 project staff divided into four teams in the second semester of Year 1, and 16 project staff divided into six teams in the first semester of Year 2. A third of the project staff returned for multiple semesters of PiPES curriculum interventions.

An important component for project staff was prior training on rural Appalachia. All PiPES staff are required to participate in yearly face-to-face trainings that offer information about life in these communities. One training included an overview of the cultural traditions and local economy while another included a panel of speakers who worked in rural Appalachian communities. PiPES staff were also assigned required articles on SCCT, school-based interventions in rural Appalachia, and prospective first-generation college students.

Program Evaluation Activities—Because our purpose was to understand the experiences of those participating in a complex, multiweek intervention, we chose a mixed method program evaluation methodology for our study. Program evaluation that utilizes rigorous methodology can be an effective research method (Epstein & Klerman, 2013). Epstein and Klerman (2013) suggested a multipronged approach to program evaluation. They believed that a program must be evaluated in steps, with formative and process evaluation occurring before efficacy and effectiveness evaluation can occur. These extra steps ensure that the program is fully developed and feasible before considering pre-post improvement on specific constructs. This article represents the results of our formative and process evaluation of our intervention through detailed exploration of qualitative and quantitative data on the experience of participating in the program.

Greene, Caracelli, and Graham (1989) offered a rigorous framework for mixed method evaluation processes. Using a holistic mixed method, integrated design (Caracelli & Greene, 1997), we sought to use both qualitative and quantitative evaluation results to more fully understand the complex phenomena of the experience of participating in our multiweek intervention. Holistic designs often originate from a theory base that guides the evaluation process; evaluation results lead to alterations in program delivery based on participant comments. Greene, Benjamin, and Goodyear (2001) described this design as originating from a substantive theory view, where evaluation should offer ways for practitioners to address complex social issues through analysis of a program and its design. Mixed method program evaluation offers the opportunity for triangulation, increasing understanding of findings, and providing additional insight into results (Greene et al., 2001). The use of this rigorous method served to establish the extent to which the career education program is sufficiently developed to be implemented in ways that are realistic and feasible for our stakeholders and engaging and enjoyable by our students, a necessary precursor to future

research examining the next level of questions about the efficacy of the program itself (Epstein & Klerman, 2013).

Survey development—The program evaluation was designed to help the PiPES team better understand project impact and effectiveness along with systemic, organizational, and individual processes that impacted PiPES success and sustainability. The evaluation followed the Joint Committee on Standards for Educational Evaluation program evaluation standards, a widely used guide for ensuring reliable and valid program evaluation results (Yarbrough, Shula, Hopson, & Caruthers, 2011). For example, external evaluators helped analyze the data to increase trustworthiness, evaluation included both high school students and PiPES staff, and both qualitative and quantitative data were collected. In addition, the evaluators followed the American Evaluation Association's (2004) guiding principles for evaluators, which promote professional evaluation practices. Data were collected after each round of the intervention, and all evaluations were anonymous to increase honesty of responses. Survey questions were developed jointly between the program directors (the first and second authors) and the external evaluators, all of whom have training on program evaluation strategies. Lastly, all parts of the evaluation connected to the theoretical frame used in the intervention.

Postcourse survey: Students—Upon PiPES course completion, participants answered an evaluation survey, in which they rated their agreement with a set of statements about their satisfaction with the course and the perceived usefulness of the PiPES curriculum using Likert-type scales ranging from *strongly disagree* to *strongly agree.* Sample items included "PiPES class activities helped me learn more about myself" and "PiPES helped me think about new options after high school." Students also rated the degree to which their interests in postsecondary education had changed ("less," "the same," or "more") as a result of the curriculum. A separate qualitative postcourse evaluation was administered to half of the classrooms that received the curriculum. The qualitative survey contained six open-ended questions, such as "What is the most important thing you learned in PiPES?" and "What else do you wish you had been able to learn in PiPES?" Qualitative data provided project staff with more detailed feedback on the course. All data were coded by at least two evaluation team members using both preset and emergent themes. Codes were eventually combined into broad categories. Qualitative results were analyzed through thematic analysis, using an essentialist method to identify the meaning of the experience for participants (Braun & Clarke, 2006). Key themes appeared across participants and were coded in a deductive manner to align with the research questions (Braun & Clarke, 2006). Potential themes were generated, searched for, reviewed, and refined as needed until a final set presented itself. Coding lists were compared as needed for cohesion, and discussions helped address any differences in coding to increase reliability.

Postcourse surveys and blogs: Staff—Project staff who facilitated the PiPES curriculum were also asked to complete a staff evaluation survey upon completion of the course. This survey included 10 questions, 2 quantitative and 8 qualitative, which evaluated staff perceptions and feedback on course curriculum, implementation, perceived impact, and overall reflections. Quantitative questions used a 10-point Likert-type scale ranging from 1

(not at all) to 10 *(completely).* Sample questions included "How effective was the PiPES curriculum?" and "How engaging was the PiPES curriculum?" Sample qualitative items included "What was your greatest success this semester?" and "What would you do differently next time?" In addition to the postcourse survey, PiPES staff submitted weekly online blog posts after each day of teaching. Within the blog post, staff members summarized the day's events and offered any suggestions to staff members who would be teaching the curriculum later in the week. All project staff had access to the online blogs, and the blogs were used as evaluation data.

Findings

Postcourse Survey: Students

A total of 867 students across the three schools completed the postcourse survey during the first three rounds of intervention (Table 2). Overall, the majority of students agreed or strongly agreed that the PiPES curriculum helped them learn more about themselves (66%), learn more about options after high school (88.6%), and plan for their future (76.3%). Most students also agreed or strongly agreed that they learned new things during the course (86.3%) and that the course helped them think about new options after high school (78.6%). Many students maintained the same level of interest in attending a 2- or 4-year college (62.6%) that they had prior to participating in the intervention; however, there were also many students whose level of interest in attending a 2- or 4-year college (34%) increased after the course.

The qualitative survey asked students to share more about why their interest levels were less, the same, or more. Of 125 students in the first two rounds of intervention who said the course did not change their interest in attending college, 58% explained that they were already planning on going to college and an additional 23% reported already deciding on their future plans. Of the 63 students who stated on the qualitative survey that PiPES changed their ideas of attending college, all but one stated that PiPES increased their interest in college.

When asked about the most important thing learned from the PiPES course, students' qualitative responses revealed three themes that pertained to (1) college, (2) themselves, and (3) jobs and/or careers. In terms of college, students reported learning about the options available to them after high school, the degree and education needed for various career choices, the value of a postsecondary degree, and important information regarding financial aid. Sample comments from students included "I have to participate in more schooling for the career I want" and "You get a better degree which will help you make more money." Another student emphasized the impact PiPES had on his understanding of college by stating, "The way they have talked about college shows how important it is and what all I can experience." In terms of themselves, students reported learning that they can go to college and they do have options after high school. Some students reported that they had not considered college or were unsure about pursuing a postsecondary education before the PiPES course. Students shared comments such as "I didn't plan on going to college, but now I am trying for 2 years at vocational [school]" and "I wasn't sure about college until PiPES." Other students had planned on attending a 2-year postsecondary institution but were now

considering a 4-year institution. One student stated, "I now know that it will be fairly easy to transfer from a 2-year to a 4-year institution so you could continue your education." The most important things students reported learning about careers included how many career options are available to them, finding out about specific jobs they would like to go into, and how much they could earn in jobs requiring a postsecondary degree. Suggestions for improvement from students included wanting to learn even more about things pertaining to college, wanting to learn more about jobs and careers, and wanting to learn about life skills for their future.

Regarding PiPES' influence on STEMM career interest, quantitative responses indicated that 28.8% of students had increased interest, 60.2% reported that their interest had not changed, and 10.3% reported reduced interest as a result of participating in PiPES. The qualitative responses helped increase understanding related to STEMM career interest. Of those reporting no change in interest, about one quarter indicated they already planned to enter an STEMM career while another quarter suggested that they had no interest in an STEMM career.

Postcourse Survey and Blog: Staff

On the postcourse staff survey, staff rated the effectiveness of the PiPES curriculum as moderately high *(M = 7.1 of 10)*. Similarly, staff provided a moderately high rating for how engaging the curriculum was for students ($M = 6.9$ of 10). One staff member noted, "[o]ur interventions have a nice pace and move in a clear and additive fashion. The students seemed to make connections that each week built on the previous week." Staff also seemed to enjoy when several activities connected to and reinforced a specific concept, reporting that these helped "to keep the class engaged and move towards putting everything together."

In addition to overall effectiveness, staff discussed specific activities that they found particularly successful. One staff member "felt that the activities (heroes, values, and strengths) offered a nice connection to how the students will think about the careers they want to pursue in the future." The online career research was also praised for providing students the opportunity to explore career interests in more depth. A staff member shared about this activity that, "Some students' eyes lit up when delving more [deeply] into their career interests, especially with the salary and task sections of O*NET." Finally, the college-going vocabulary game appeared to be particularly successful with one staff member noting, "The … game was a hit!" and another stating, "The college lingo proved to be something these students really needed to go over because they did not quite know what all the terms meant."

Discussion

We completed a program evaluation on a program designed to increase awareness of postsecondary education and career options for rural Appalachian youth. The curriculum was based on SCCT, an empirically validated career and academic development theory, and all activities were designed to address one or more aspects of the SCCT model (Lent et al., 1994). Every aspect of the curriculum specifically aligned to an SCCT construct (see Table 1), thereby providing a theory-driven approach to career education programming.

The evaluation results provide important information regarding the application of college and career interventions with this population. Most participants enjoyed the curriculum and found it useful in their career and college development. The results suggest positive changes in college-going self-efficacy and student perspectives on their postsecondary interests and goal aspirations. Importantly, the curriculum provided students with new ideas and information about postsecondary planning and career exploration, beyond what they already knew. Bryan and Simmons (2009) found that rural Appalachian students face barriers such as lack of information about postsecondary terminology and college-going procedures; therefore, results suggest that the curriculum addressed a significant barrier frequently faced by these students.

In addition, students reported learning information about the usefulness of obtaining a postsecondary education in order to achieve their career goals. This indicates that the curriculum attended to recommendations by the ASCA College and Career Readiness Standards (2014) that students develop an "understanding that postsecondary education and life-long learning are necessary for long-term career success" (p. 2). As the PiPES curriculum is delivered by undergraduate and graduate students, it provides near-age role models with college-going experience to help concretely demonstrate the importance and relevance of postsecondary education. Students in rural Appalachia may be at a disadvantage in this area, as many of their family members have low levels of educational attainment (Pollard & Jacobson, 2017). It may be that connecting college directly to careers helps demonstrate to rural students the increasing necessity of a postsecondary education for many careers. Furthermore, a large portion of participants increased their interest in postsecondary education, and almost no students reduced their interest. King (2012) noted that providing career information, involving mentors, and encouraging postsecondary education may increase college-going rates in rural Appalachian youth. Overall, it seems that a program such as PiPES aimed at reducing barriers by increasing college and career knowledge, increasing self-awareness, and increasing near-peer role models, all within the SCCT framework and in a culturally sensitive context, positively influences the college and career readiness of rural Appalachian students.

Other factors appeared to contribute to the overall success of PiPES as well. For example, our staff had prior training on working with rural Appalachian students before delivering the intervention, likely helping them better understand the unique needs of these students. Also, the overall curriculum was designed specifically for rural Appalachia, attending to the cultural aspects of these communities. For example, our team regularly emphasized ways in which STEMM careers and postsecondary education could allow students to remain connected to and to contribute to their local communities, building on cultural strengths of familism and localism. Culturally sensitive interventions are more effective in counseling than those not adapted for specific populations (Nagayama Hall, Ibaraki, Huang, Marti, & Stice, 2016).

Feedback from staff highlight the importance of helping students make connections between their self-knowledge, postsecondary education, and careers. Specifically, staff indicated the effectiveness of providing self-exploration activities that connected to students' educational and career planning. They also noted the value of incorporating online career research,

allowing students to explore their interests in more depth. This is in agreement with the ASCA College and Career Readiness standards (2014) that students "gather evidence and consider multiple perspectives to make informed decisions" (p. 3). In addition, this is consistent with findings by Bennett (2008) exploring how aspects of self, such as values, can assist in the educational and career decision-making process of rural Appalachian individuals.

A highlight of this particular curriculum is its direct connection with SCCT, an empirically supported theory of career development. The research on rural Appalachian students (e.g., Ali & Saunders, 2006, 2009; Brown et al., 2009) indicates that social cognitive variables such as self-efficacy, outcome expectations, and perceived barriers and supports directly impact these students, so building a curriculum based on these variables helps connect the intervention to the unique context of the population. It is likely that many of the activities will be effective for other diverse groups as well, but they clearly assist this group.

Limitations and Future Directions

There are several limitations to this work. First, only three high schools received the PiPES intervention, so findings may not generalize to all rural Appalachian high school students. In addition, our sample of high school student participants lacked ethnic diversity. Although this is typical for rural Appalachian populations, it limits generalizability to more ethnically diverse Appalachian and/or rural communities. Additionally, all of our data were based on self-report from students or program staff, which potentially impacts the validity of results. All data were collected anonymously to try and increase the honesty in responses, but it is unknown if participants answered with full openness. Also, it is possible that our longitudinal comparison design, which led to both 10th and 11th graders receiving the intervention in Year 1, may have influenced the results. We do not know for certain that 10th and 11th graders experienced the intervention in the same way as there is no way to ascertain if there were developmental influences on the results. However, no significant differences appeared between the Year 1 and Year 2 results, suggesting that development did not change the experience of the intervention.

Lastly, the evaluation relies on students' self-reported attitudes at a single point in time; longitudinal studies are needed to determine whether our students' self-reported positive attitudes toward postsecondary education actually translate into pursuit of postsecondary education. Future evaluation of career education programs such as PiPES should also include explicit evaluation of the extent to which students experience changes in theoretically relevant variables. For example, to what extent do such career education programs lead to increases in college-going and career decision self-efficacy, college and career outcome expectations, or perceived barriers to and supports for career and educational pursuits? Finally, it would be useful to examine the extent to which the PiPES curriculum is effective and useful in other populations; although it was designed specifically for a rural Appalachian population, its clear grounding in SCCT should make the basic program more broadly relevant and readily adaptable to other cultural contexts.

Implications for School and Career Counselors and Educators

ASCA (2012) recommends school counselors develop curricula that support college and career readiness and promote career development, and the U.S. Department of Education (n.d.) insists that all students should be college and career ready when they graduate from high school. School and college preparatory counselors may provide career instruction to students as an element of direct student services. Curriculum should incorporate experiential activities to capture students' attention rather than delivering solely didactic presentations. Delivering engaging career instruction in classrooms rather than as large auditorium presentations provides deeper discussion and facilitates incorporation of empirically supported *critical ingredients* of effective career interventions such as individualized feedback and social support (Brown & Ryan Krane, 2000). Even though classroom guidance logistics can be challenging in high school settings, our results demonstrate this format can be effective with students. Counselors can collaborate with other teachers to arrange time for delivering classroom guidance lessons in core subjects or electives. For example, PiPES worked with English and Biology teachers at two of our schools to deliver classroom lessons. At a third school, PiPES provided instruction during an ACT testing preparation course in our first year and during a response to intervention block during the second year. We also collaborated with the Gaining Early Awareness and Readiness for Undergraduate Programs counselor at each school because of the natural goals alignment between our two programs. This collaboration provided another way to involve career and academic counselors in programming.

PiPES uses STEMM careers to provide concrete career examples based on public health disparities and needs in the local communities. PiPES introduced STEMM careers through the framework of personal interests based on Holland Codes. Counselors may use similar frameworks to provide concrete career ideas to students. Using personal interests and concrete career examples may help students find careers more personally relevant. This approach may also increase students' awareness of the need for postsecondary education to reach career goals. School and career counselors can determine employment needs in their local communities to provide targeted and relevant career information. Connecting with local employers to determine projected job opportunities can ensure students are aware of available options.

Counselors working with rural Appalachian students should maintain cultural awareness when developing and providing interventions for postsecondary success. School counselors previously noted the importance of recognizing and responding to the local culture when working in rural or small towns (Sutton & Pearson, 2002). With Appalachian students, the cultural values of strong attachment to place, family ties, creativity, and egalitarianism may influence student and family decisions about postsecondary education (Keefe, 2005). Infusing Appalachian cultural values and perceptions into career education lessons about postsecondary education and careers increases the responsiveness of the intervention to student needs. Counselors working with rural Appalachian students can also provide information about local postsecondary education options to connect with the values of attachment to place and family.

PiPES was developed to address potential barriers experienced by rural Appalachian youth through a culturally informed lens. Program evaluation data provided evidence of the usefulness of the curriculum to provide new information and assistance for postsecondary planning and career exploration. Because of its clear grounding in SCCT, the PiPES curriculum may serve as a useful framework for career education efforts in other communities as well. By addressing the college and career planning needs of high school students in theoretically grounded and culturally sensitive ways, counselors can better prepare youth for postsecondary success.

Acknowledgments

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Table 1.

PiPES Learning Experiences and Intended Outcomes by Curriculum Week and Targeted SCCT Construct.

Week		Self-Efficacy	Outcome Expectations	Barriers and Supports	Interests	Goals/Aspirations
Week 1: Introduction and rapport building	Activities	Near-peer role model introductions			Icebreakers	10-Year class reunion
	Intended outcome	How confident about PSE and careers are others like me?	Why do others like me think PSE/STEMM is useful?	How have others like me overcome barriers and found support?	What makes me similar to and unique from others?	What do I want my life to be like in ~ 12 years?
Week 2:	Activities	Strengths/heroes and who am I? worksheet	—	Discussion	Childhood activity; Holland Career Party; Strengths/Heroes; Who Am I?	Who Am I? Worksheet
Exploration of self	Intended outcome	What am I confident about? Where does that come from?	—	How does knowing myself help me anticipate barriers and supports?	What are my interests, values, and strengths?	How does knowing myself inform my goals?
Week 3:	Activities	O*Net exploration, worksheets, and discussion				
Exploration of the world of work	Intended outcome	For what tasks/domains do I have more/less confidence?	What are the salaries, prestige of various career options?	What barriers to/supports for different careers might I have?	What careers might be a good fit, given my interest, values, and so on?	What are some career options I'd like to explore further?
Week 4: PSE	Activities	College lingo taboo game; four corners barriers activity	Discussion	Four corners barriers activity	Discussion	Discussion
options and connections to work/ career	Intended outcome	How does understanding basic information about PSE options affect my confidence? How confident are my (near) peers about coping with barriers?	Why PSE is valuable?	What barriers to/supports for PSE do I and others like me anticipate? How might I cope with the barriers and where might I find support?	How does my selfknowledge relate to possible career and PSE options?	What PSE options make the most sense, given my career goals?
Week 5: STEMM	Activities	Discussion of draw-A-Scientist activity with peers and near-peer role models; videos; discussion of STEMM careers				
	Intended outcome	How confident are others like me about STEMM?	What does STEMM contribute to society? What do scientists enjoy about their work?	What barriers to/supports for STEMM might I encounter? How have others overcome barriers/found support?	What STEMM career options might be a good fit for my interests, values, and strengths?	What are my PSE and career goals?
Week 6: Goal	Activities	Discussion of students' hopes and fears; integrative reflection over PiPES curriculum; goal-setting discussion and worksheet				
setting and wrapping up	Intended outcome	What am I more/less confident about re: My PSE and career goals?	How would pursuing PSE/ STEMM help me meet my goals?	What barriers might I face and where can I find support?	What are my career interests and how can I explore them further?	What are my next steps toward meeting my PSE/ career goals?

Note. SCCT = social cognitive career theory; PSE = postsecondary education; STEMM = science, technology, engineering, math, and medical science; PiPES = Possibilities in Postsecondary Education and Science.

Table 2.

Postcourse Student Survey.

Survey Item		Strongly Disagree	Disagree	Agree	Strongly Agree
1. PiPES class activities helped me learn more about myself	*n*	80	211	461	111
	%	9.2	24.3	53.2	12.8
2. PiPES class activities helped me learn more about options after high school	*n*	29	67	403	365
	%	3.3	7.7	46.5	42.1
3. I learned new things in PiPES	*n*	33	83	482	266
	%	3.8	9.6	55.6	30.7
4. PiPES helped me plan for the future	*n*	54	147	465	197
	%	6.2	17	53.6	22.7
5. PiPES helped me think about new options after high school	*n*	47	137	461	220
	%	5.4	15.8	53.2	25.4
			Less	Same	More
6. After participating in PiPES, my interest in attending a 2-year or 4-year college is	*n*		22	543	295
	%		2.5	62.6	34

Note. PiPES = Possibilities in Postsecondary Education and Science.