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An Urban School District-University-Industry Partnership to Increase Diversity in the Health Professions: Lesson Learned from the University of Kansas Health Science Academy

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Abstract

School-industry partnerships bring invaluable cognitive and material resources to K-12 but might inadvertently contribute to widening the achievement gap. Lack of social capital and industry connections make urban schools less likely to partner. This paper describes the University of Kansas (KU) Medical Center Health Science Academy, a university-industry-K-12 partnership designed to increase the number of underrepresented students in health science careers. Using data gathered from 1) meetings with stakeholders, 2) semi-structured interviews with key informants, and 3) focus groups with students, we present the features that made the process and outcomes of this partnership a success. Preliminary results from our pilot year show that students experienced a positive change in their knowledge and intention to pursue a health career.

Keywords

Diversity; Health Science; Partnership; Pipeline; Urban Schools

INTRODUCTION

Partnerships between schools and outside agencies are an increasing educational trend but far from new. The 2001 No Child Left Behind Act revitalized the Educational Partnership Act of 1988 by identifying community, family, university, and industry partners as key allies for underperforming schools. Ample evidence in the literature supports the benefits of partnerships (Clark, 1999; Corbin, Chu, Carney, Donnelly, & Clancy, 2017; DeVito, 2016; Greene & Tichenor, 1999), particularly for science, technology, engineering, and mathematics (STEM) education (Madden, 2016; Seth, Carr, Jr, Wenger, McNair, &

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Tangorra, 2014; Tytler, Symington, & Clark, 2017; Tytler, Symington, Williams, & White, 2018; Tytler et al., 2015; Wrensford, Stewart, & Hurley, 2019). Collaborations with industry partners and universities bring to the classroom content expertise otherwise unavailable (Badgett, 2016; Clark, Tytler, & Symington, 2014; Radinsky, Bouillion, Lento, & Gomez, 2001; Willems & Gonzalez-DeHass, 2012; Wrensford et al., 2019). Industry and academic institutions envision these partnerships as avenues for developing a diverse workforce (Badgett, 2016; Clark, 1999; Clark et al., 2014; Erwin, Blumenthal, Chapel, Richardson, & Allwood, 2004; Goodlad, 1994).

K-12 relationships with universities and industries have immense potential to bring cognitive, social, and material resources to those most in need (Boland, 2016; Fincher, Sykes-Brown, & Allen-Noble, 2002). They may also increase future workforce diversity and preparedness (Blumenthal, Allwood, & Erwin, 1999; Coronado, Shuster, Ulrich, Anderson, & Loest, 2012; Erwin et al., 2004; Fincher et al., 2002; Tobias, Glazer, & Mentzel, 2018). However, results have been mixed. University, industry, and school partners have conflicting interests and vast logistical and cultural differences that create tensions and often hinder the collaboration's long-term survival (Badgett, 2016; Balsler, 2017; Bridwell-Mitchell & Cooc, 2016; Chiu & Zhang, 2013; Stevens, 1999). Making partnerships available, equitable, and sustainable necessitates a change in their formation, which is strongly influenced by dedicated resources, teacher connections, and the strength of pre-existing partnerships (Bridwell-Mitchell, 2017). Schools in neighborhoods with greater occupational diversity are more likely to establish partnerships and provide opportunities to which students have already been exposed; schools with the greatest resource needs are least likely to partner (Bridwell-Mitchell, 2017). A proactive approach is needed to ensure that disadvantaged school districts have access to the benefits of engaging outside partners.

For 20 years, the Office of Diversity and Inclusion (ODI) at the University of Kansas (KU) School of Medicine has partnered with Kansas City Kansas Public Schools (KCKPS) to provide enrichment opportunities for students interested in the health sciences through afterschool and summer programs (KCK Saturday Academy). KCKPS are in Wyandotte County, an urban area consistently ranked last in state health outcomes (Charkhchi, Wang, Caffo, & Yousem, 2019; Robert Wood Johnson Foundation, 2019; Wyandotte, 2019). The KU Health Science Academy is an expansion of other ODI pipeline efforts and a response to the districts' Diploma+ initiative, which focuses on graduating all students with a high school diploma — and additional credentials and workforce experiences — that demonstrate preparation for college and careers (Diploma+, 2019). The success of Diploma+ depends on developing strong partnerships.

As is often the case for high-needs urban districts, KCKPS has found forming partnerships challenging. Over 33 percent of its teachers have been teaching for less than three years; 86 percent of students come from economically disadvantaged backgrounds; and only 17 percent of county residents over the age of 25 hold a bachelor's degree (Tomkins, Zhang, & Heavlin, 2017). Such statistics make partnerships less likely to develop organically and more likely to require intentionality among all parties.

This paper describes the formation of the KU Health Science Academy and outcomes of its first year of implementation. An intentional partnership among an urban school district, an academic medical center, and an affiliated health system, the academy offered students in two KCKPS high school health science classes the opportunity to participate in a semester-long program at the KU Medical Center. Students and teachers connected with professionals and gained exposure to health careers and their connections with community activism. The partnership's success was contingent upon ensuring a mutually beneficial arrangement, institutionalizing the program, building in balanced power, and identifying, designating, and positioning institutional navigators to make progress.

METHODS

Study Design and Measures

Data were collected in the 2018–2019 school year for three purposes: 1) to guide partnership formation; 2) to measure the academy's effect on students' knowledge and intention to pursue a science-based career; and 3) to measure students' satisfaction.

For purpose 1, *to guide the formation of the partnership*, we used meeting notes and semi-structured group interviews with key stakeholders in the partnership (see Table 1) to conduct a landscape analysis. Three questions guided the group interviews: 1) Why don't we currently have a partnership? 2) How would establishing a partnership benefit all parties? 3) What would we need to make this project sustainable? The data collection and analysis processes were initiated concurrently to guide future conversations.

For purpose 2, *to measure the KU Health Science Academy's effect on student's knowledge and intention to pursue a science-based career*, we administered the Health Science Academy Survey at the beginning and at the end of the program (Attachment 1). Students took the survey on-line using Qualtrics. The questions, based on social cognitive career theory (Lent, Brown, & Hackett, 2002), prompted students to report their knowledge of, interest in, and motivation and confidence to pursue health science degree programs and careers. The instrument was modeled on the STEM Career Inventory Survey (Kier, Blanchard, Osborne, & Albert, 2014), a validated and widely used instrument for secondary school students. To assess our survey's validity, two KUMC faculty members and one measurement expert evaluated it for clarity, relevance, and completeness. Two external evaluators evaluated the online version for readability and ease of use. Assessments developed for each curricular unit examined student knowledge and changes in interest using a retrospective pre-posttest format. Students rated their knowledge of and interest in specific topics and careers before and after attending the KU Health Science Academy using a three-point scale (none, some, a lot). Authors, researchers, and unit coordinators developed the content based on the unit's objectives, topics covered, and careers introduced.

For purpose 3, *to measure student satisfaction*, results of the unit assessments were combined with guided classroom discussion led by two members of the research team in both participating classrooms at the end of each unit. Students were asked the following questions: What did you learn during this unit? What got you excited about this unit? Would you consider a career in this field? What elements of this unit should be reconsidered?

All required documents, permissions, and identifications were collated into one contract that was approved by all partners, then reviewed with the students and signed by their parent or guardian. The data collection protocol, all aspects of study involvement, and teacher and parent/student consent procedures were approved by the university's Institutional Review Board.

Participants

Purposeful and snowball sampling were used to identify key individuals from KCKPS, KU, and the University of Kansas Health System (UKHS). Table 1 provides a list of stakeholders (n = 15) whose insights were gathered during three meetings and two semi-structured group interviews to inform the partnership process. Meetings and group interviews lasted approximately one hour. University staff led the interviews. Additionally, 22 university faculty, 17 health-system staff, and five community members taught in the KU Health Science Academy and contributed to curriculum implementation.

The inaugural class in Spring 2018 was comprised of 43 students enrolled in a health science class at two different high schools in the KCKPS district. They visited the KU campus twice a week for 1.5 hours each day. The district and university staff collaboratively identified participating teachers from a pool previously involved in *Teachers and Students for Community-Oriented Research and Education*, an NIH-funded project that “helped teachers develop and teach health science lessons that provide students with learning experiences that grow their interest and knowledge about the health sciences” (Battarbee, 2017; Fox & Lash, 2017).

Data Management and Analysis

Interviews were recorded using university-issued devices and stored on REDCap (Harris et al., 2009). Qualitative data were analyzed in two stages (Lauckner, Paterson, & Krupa, 2012). Stage 1 focused on identifying themes from group interviews, meeting notes, and student focus groups. Stage 2 involved cross-case analysis and common theme development. We used Qualtrics (2014), a secure web-based software, to create, administer, and store survey data. Statistical analysis was used to draw inferences from survey data.

RESULTS

The three main accomplishments of the first year of the KU Health Science Academy were the creation of the partnership, the development of the academy's infrastructure and curriculum, and the increase in students' interest in pursuing a health career.

Partnership Formation

The KU Health Science Academy is a partnership of the University of Kansas Medical Center (university), KCKPS, and the UKHS (health system). The university's prior engagements with KCKPS had focused on knowledge sharing rather than workforce development. The academy was the first initiative that the affiliated hospital formally joined. Table 2 presents an approximate timeline of partnership development. Once all partners agreed to participate, university staff held three, semi-structured group interviews that

brought together university leadership, health system representatives, and school district personnel. The goal was to identify barriers, key players, partnership benefits, and sustainability strategies.

Barriers.—Lack of resources — chiefly, lack of continuous funding — was often mentioned as a barrier. Many university programs have suffered from reduced budgets. Moreover, the university’s efforts had been school-specific. Most arose from personal connections or requests from individuals working on campus; once they retired or left, the programs were hard to sustain. From the districts’ perspective, additional resources and personnel were needed to navigate the academic bureaucracy. Staff attrition similarly hindered these informal and person-dependent partnerships.

When a campus-wide partnership was proposed, the common response was surprising: no one thought it was possible. The UKHS representative said that although they are constantly approached by school districts in the surrounding areas, they had never been approached by KCKPS: “Honestly, historically, we have waited for people to come and do the ask and the ask has never been made.” A district administrator overseeing the Health Science Academy said, “I don’t think anybody really thought that it was possible in terms of working together to make sure something like that can happen.” Logistical barriers, such as transportation costs, the constraints of the school schedule, and adherence to K-12 curricular standards were also prevalent themes.

Key players.—University, UKHS, and KCKPS participants were selected because their job descriptions related to the program’s objectives. They knew their institutions well, were skilled at making connections between departments, the health system, and the community and could help to address barriers. Acting as cultural brokers, or navigators, for each institution, they were asked to draft a formal agreement and to lead curriculum development and implementation.

Benefits.—From the KCKPS perspective, partnering with KU and UKHS aligns with its mission and that of Diploma+ to bring relevance into the classroom. This collaboration would expose district students to a wide-variety of careers. One administrator commented, “I really wanted students to understand that there are opportunities out there beyond the ones that they generally think about like doctor or nurse ... there is allied health, support positions, and they need to know that.” For KU, the local school partnership would undoubtedly advance its diversity goals since over 80 percent of KCKPS students come from underrepresented backgrounds; collectively, they speak more than 50 languages at home. For UKHS, the partnership advances one of their core goals: to attract and retain the most competent and engaged workforce in the area. “This is a win-win. We are having a horrible time filling out some positions,” explained a KU Health System leader. “Even if the kids don’t end up working here, maybe their families do, and that’s great.” All partners commented on how providing innovative educational opportunities could affect overall health outcomes and opportunities in the county.

Sustainability.—Given past experiences, all partners wanted the program to be institutionalized, with signed agreements and job descriptions that ensured designated time

to carry out the mission. They strongly rejected the idea of “charity work” that would not always reflect all parties’ goals and was likely to disappear in the long run. As one KU Health System partner explained, “I don’t want to do kind of the back-door approach in terms of volunteerism. I want to be targeted, so we can see improvements and outcomes. You know you can do a food kitchen, and people feel great when they leave, but at the end of the day, have you really impacted anything?” Formalizing the process was also perceived to balance power and to ensure the investment of all partners. In addition, the project had to be visible and publicly celebrated by all parties. Visibility would contribute to building historical memory around the project, that is, shared knowledge about the Academy amongst campus and community constituents that would therefore help attract more participants at every level. The Closing Ceremony for the 2019 Health Science Academy was celebrated on the University of Kansas Medical Center campus, with leaders of all entities represented and ample coverage by the KU and UKHS Communications and Media department.

Program Description

Aside from forming the partnership, a major accomplishment was developing the academy curriculum. The overarching goal of the KU Health Science Academy is to increase minority representation in health science fields. It has three short-term goals: 1) expose students to the health professions, 2) assist teachers and students in forming professional relationships, and 3) empower students to connect a career in the health sciences with community activism. Teachers, hospital leaders, and university faculty devised the curriculum. The students’ time spent on campus was designed to supplement the curriculum of their regular Health Science class. Table 3 provides an outline of the on-site curriculum. The sessions used a variety of formats, such as panels, lectures, hands-on activities, tours, and flipped classrooms.

Simultaneously, as part of their coursework at school, students worked on a in-classroom project exploring health disparities in their community and how they, as students and county residents, could identify and help to address them (see <http://www.kumc.edu/t-score-ks/units-and-lessons.html>; Helmer, Schottdorf, Neef, & Battaglia, 2017). The goal was for students to use the methods of inquiry, data collection, and analysis introduced by different health professionals in the academy to solve local problems. Based on their topic, students were paired with a KU academic medical center research mentor, who provided feedback as students worked on developing a research poster to present their individual projects and findings. The academy is dedicated to ensuring that students see the connection between any health profession and improving public health outcomes that affect their communities.

Preliminary Student Outcomes

Students gained *a deeper and broader understanding of health careers*. Following the curriculum, 84 percent of respondents reported knowing about the different types of health science careers; 89 percent agreed that they knew about the different types of health science certificates and programs; and 86 percent reported their intention to attend college and earn a health science degree. From a workforce perspective, 58.1 percent of responding students strongly agreed that they intended to apply for a job at UKHS in the future, and 61 percent strongly agreed that they were interested in pursuing a job at our hospital. Overall, 90.3

percent of responding students strongly agreed or agreed to the statement that they knew about jobs in the hospital.

Students' and teachers' comments during whole-class focus groups aligned with the partnership's goals. One teacher pointed out, "Previously, [students] had a narrower view of healthcare. Now they can see how so many different careers come together to form the patient experience. Hospitals are like a mini-city with many people facilitating different tasks." The academy expanded the students' views of viable career paths in healthcare. One said, "I learned that in the meantime of getting my degree, I can be a transporter and get to learn the facility and then become what I want to be. If I am a transporter, I will know my way around the hospital and the basic rules of the hospital and that will help me out a lot in becoming what I want." Students also established connections between health careers and improving community outcomes. One commented, "A topic that I really enjoyed was community health. It made me really think about my community and how I want to help my community in any way that I can. I think that everyone that gets the chance to do this is lucky."

Finally, UKHS leadership reported that the academy has the potential to prevent burnout. "They were so excited to talk about what they do," a hospital executive said about staff involved with the academy. "And that creates a sense of pride that they do not always get a chance to have. To be able to stand up and tell kids that are in school about a job like theirs is powerful. If you think about resiliency, one of the most important pieces to bounce back is finding joy in what you do." University and district faculty echoed those feelings. K-12 teachers shared that students took pride in coming to KU. One instructor noted, "They felt special, you know — the lanyard, leaving the school — but if you want to be part of this, you have to work hard, and that is a good message to send across the school."

DISCUSSION

Successfully partnering with urban school districts to increase health career interest among their diverse student bodies requires a novel approach. Part of our model reflects best practices outlined in the literature (Badgett, 2016; Fincher et al., 2002; Radinsky et al., 2001; Soto-Greene, Wright, Gona, & Feldman, 1999; Willems & Gonzalez-DeHass, 2012; Wohlstetter, Malloy, Chau, & Polhemus, 2003), but the specific focus on partnering with underserved K-12 districts is new. "Business as usual," or "waiting for them to come" will not elicit change. True commitment to achieving a diverse workforce requires an analysis of meritocracy, context, access barriers, and all partners' motivations. Partnerships must contribute to institutional goals. Power must be balanced; and all partners should add to, and benefit from, the design. The success of the KU Health Science Academy relied on mutually beneficial agreements, institutionalizing the program, building in balanced power, and most important, identifying and designating institutional navigators who are positioned to make progress (see Fig. 1).

To those ends, curricular alignment with grade-level standards and competencies is crucial to closing the achievement gap. The content of the academy curriculum reflects that intent. Balancing power includes investment but also empowerment. Transportation costs, for

instance, were a concern from the beginning. Rather than adopting a “savior-like” approach and funding the cost, partners worked with the district to apply for outside funding needed to transport students to partner sites, a key goal of the Diploma+ initiative. Further, institutionalizing opportunity requires legal agreements that ensure continuous engagement and equal access opportunities for K-12 schools to gain access to career development for students. To make these experiences accessible to all students, universities must increase their visibility and proactively seek the engagement of underserved school districts that are less likely to have the resources needed to seek out these partnerships. Designated navigators can direct the university’s legal counsel and marketing and communications personnel to appropriate administrators and teachers in school districts to create a comprehensive, perpetual affiliation agreements. In our case, formalizing the affiliation and addressing the numerous requirements up front facilitated program implementation and its continuation in the next academic year.

Finally, we must stop working in isolation. Our multidisciplinary approach to the KU Health Science Academy allowed students with different goals to discover career paths they did not know existed. It also proved cost-effective in achieving the diversity goals of many health professions schools on campus.

CONCLUSION

Building meaningful and enduring partnerships with diverse urban school districts could be a catalyst for increasing diversity in the future healthcare workforce and improving the health outcomes of the most vulnerable. As K-12 education develops ways to expose students to viable careers, both universities and health systems must reassess their traditional community-engagement approaches. Competition for limited resources and lack of social networks make high-needs urban school districts less likely to form industry partnerships, so partners seeking to engage with them must take a proactive approach. Adopting a business-like mentality that embraces cultural richness will build mutually beneficial partnerships. The KU Health Science Academy is currently in its second year and continues to receive full support from all partners. They see in this educational adventure a sustainable effort to increase opportunities for students, workforce diversity, and community well-being.

APPENDIX A: HEALTH CAREERS SURVEY: HEALTH SCIENCE ACADEMY POST SURVEY — SPRING 2019

Health Science Academy Students,

Congratulations on completing the Health Science Academy at KUMC! This survey asks questions about your experience with the Health Science Academy course as well as your knowledge, attitudes, and future aspirations related to health science careers and jobs. It should take less than ten minutes to complete, and all answers you provide will be kept strictly confidential.

1. Please enter your student identification number (on your ID card):

2. Please enter your initials (first letter of your first name, followed by first letter of your last name):
3. Please enter your date of birth (MM/DD/YYYY):
4. What is your race? Please mark all that apply.
 - American Indian / Alaska Native
 - Asian
 - White
 - Black / African American
 - Native Hawaiian / Other Pacific Islander
 - Other (please specify):

5. Are you Hispanic / Latino(a)?
 - Yes
 - No
6. What is your primary language?
 - English
 - Spanish
 - Other (please specify):
7. What is your gender?
 - Female
 - Male
8. What is the name of your teacher for this class?
9. What do you plan to do after completing high school?
 - 2-Year Community College
 - 2-Year Technical College
 - 4-Year University
 - Military
 - Work; No Plans to Attend College
 - No Plans
10. Please list your top three career choices (example: nurse, surgical technician, hospital administrator, etc.):

Please rate your level of agreement or disagreement with the following statements:

	Strongly Disagree	Disagree	Neither Agree nor Disagree	Agree	Strongly Agree
11. I plan to go to college and study in a health science field	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
12. I know about different types of health science certificates and degree programs	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
13. I am confident that I can complete a health science certificate or degree	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
14. I know about different careers in health science fields	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
15. I have role models that are in health science careers	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
16. I plan to become a health science professional	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
17. I am interested in working at University of Kansas Medical Center	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

18. Please list any specific health science careers would you like to learn more about: Please answer this question by thinking about BEFORE and AFTER you participated in the Health Science Academy course:

	Not at all interested	Slightly interested	Moderately interested	Interested	Very Interested
19. BEFORE Health Science Academy, my interest in pursuing a health science career:	<input type="radio"/>				
20. AFTER Health Science Academy, my interest in pursuing a health science career:	<input type="radio"/>				

21. What health science or science courses do you plan on taking next year?

22. Please describe any plans you have to follow up with KUMC hospital staff or researchers

23. Please describe two or three Health Science Academy experiences that were most meaningful for you, and why:

REFERENCES

Badgett K. (2016). School-business partnerships: Understanding business perspectives. *School Community Journal*, 26(2), 83–105.

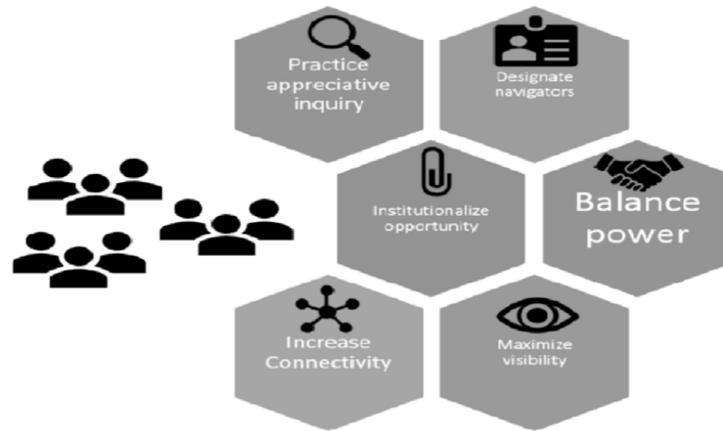
Balsler WF (2017). The emergence of PK – 12 blended capital partnerships: A framework for understanding how urban school leaders and outside partners work together (Doctoral dissertation, Boston University). Retrieved from <https://open.bu.edu/ds2/stream/?#/documents/174246/page/1>

Battarbee R. (2017). Research papers, gender bias and peer-review. *Biology Letters*, 13(8), 20170424. doi:10.1098/rsbl.2017.0424

Blumenthal DS, Allwood V, & Erwin KW (1999). A partnership model for a health professions student pipeline. *Academic Medicine*, 74(5), 569. doi:10.1097/00001888-199905000-00030

- Boland K. (2016). School-community collaborations through the lens of place-based education: Benefits and challenges. Retrieved from <https://viurrspace.ca/bitstream/handle/10613/2920/Boland.pdf?sequence=1&isAllowed=y>
- Bridwell-Mitchell E. (2017). Them that's got: How tie formation in partnership networks gives high schools differential access to social capital. *American Educational Research Journal*, 54(6), 1221–1255. doi:10.3102/0002831217717815
- Bridwell-Mitchell E, & Cooc N. (2016). The ties that bind: How social capital is forged and forfeited in teacher communities. *Educational Researcher*, 45(1), 7–17. doi:10.3102/0013189X16632191
- Charkhchi P, Wang B, Caffo B, & Yousem DM (2019). Bias in neuroradiology peer review: Impact of a “ding” on “dinging” others. *American Journal of Neuroradiology*, 40(1), 19–24. doi:10.3174/ajnr.A5908 [PubMed: 30523137]
- Chiu C-S, & Zhang J-W (2013). New attempts for school improvement and partnerships in Hong Kong: Business-university-school partnerships for school improvement. *Asia Pacific Journal of Educational Development*, 2(2), 57–71. doi:10.4324/9780203118139
- Clark JC, Tytler R, & Symington D. (2014). School-community collaborations: Bringing authentic science into schools. *Teaching Science*, 60(3), 28–34.
- Clark RW (1999). School-university partnerships and professional development schools. *Peabody Journal of Education*, 74(3/4), 164–177. doi:10.1207/s15327930pje7403&4_13
- Corbin JH, Chu M, Carney J, Donnelly S, & Clancy A. (2017). Understanding collaboration: A formative process evaluation of a state-funded school-university partnership. *School-University Partnerships*, 10(1), 35–45.
- Coronado GD, Shuster M, Ulrich A, Anderson J, & Loest H. (2012). Strategies for diversifying the pool of graduate students in biomedical sciences. *Journal of Cancer Education*, 27(3), 436–442. doi:10.1007/s13187-012-0374-8 [PubMed: 22576869]
- DeVito M. (2016). Factors influencing student engagement Unpublished Certificate of Advanced Study thesis, Sacred Heart University, Fairfield, CT Retrieved from <http://digitalcommons.sacredheart.edu/edl/11>
- Erwin K, Blumenthal DS, Chapel T, & Allwood LV (2004). Building an academic-community partnership for increasing representation of minorities in the health professions. *Journal of Health Care for the Poor and Underserved*, 15(4), 589–602. doi:10.1353/hpu.2004.0059 [PubMed: 15531817]
- Fincher R-M, Sykes-Brown W, & Allen-Noble R. (2002). Health science learning academy: A successful” pipeline” educational program for high school students. *Academic Medicine*, 77(7), 737–738. doi:10.1097/00001888-200207000-00023.
- Fox MP, & Lash TL (2017). On the need for quantitative bias analysis in the peer-review process. *American Journal of Epidemiology*, 185(10), 865–868. doi:10.1093/aje/kwx057 [PubMed: 28430833]
- Goodlad JI (1994). *Educational renewal: Better teachers, better schools*. San Francisco: Jossey-Bass, Inc.
- Greene PK, & Tichenor MS (1999). Partnerships on a collaborative continuum. *Contemporary Education*, 70(4), 13.
- Harris PA, Taylor R, Thielke R, Payne J, Gonzalez N, & Conde JG (2009). Research electronic data capture (REDCap): A metadata-driven methodology and workflow process for providing translational research informatics support. *Journal of Biomedical Informatics*, 42(2), 377–381. doi:10.1026/j.jbi.2008.08.010 [PubMed: 18929686]
- Helmer M, Schottdorf M, Neef A, & Battaglia D. (2017). Gender bias in scholarly peer review. *eLife*, 6, e21718. doi:10.7554/eLife.21718
- Kansas City, Kansas Public Schools. (n.d.) From Pre-K to Graduation: Diploma +. Retrieved 2019, from <http://www.kckps.org/diploma>
- Kansas City, Kansas Public Schools. (n.d.). KCK Saturday Academy. Retrieved from <http://www.kcksaturdayacademy.org/>
- Kier MW, Blanchard MR, Osborne JW, & Albert JL (2014). The development of the STEM career interest survey (STEM-CIS). *Research in Science Education*, 44(3), 461–481. doi:10.1007/s11165-013-9389-3

- Lauckner H, Paterson M, & Krupa T. (2012). Using Constructivist Case Study Methodology to Understand Community Development Processes: Proposed Methodological Questions to Guide the Research Process. *The Qualitative Report*, 17(13), 1–22.
- Lent RW, Brown SD, & Hackett G. (2002). Social cognitive career theory. *Career choice and Development*, 4, 255–311.
- Madden MR (2016). Systemic changes occurring in elementary schools that pursue a STEM focus (Doctoral dissertation, University of West Georgia).
- Qualtrics, I. (2014). Qualtrics. Provo, UT, USA.
- Radinsky J, Bouillion L, Lento EM, & Gomez LM (2001). Mutual benefit partnership: A curricular design for authenticity. *Journal of Curriculum Studies*, 33(4), 405–430. doi:10.1080/00220270118862
- Robert Wood Johnson Foundation. (2019). County health rankings show burden of severe housing cost tied to poor health: Report also reveals low-income families and families of color face greatest burden from housing costs. Retrieved from <https://www.countyhealthrankings.org/sites/default/files/2019-county-health-rankings-press-release.pdf>
- Seth D, Carr JJ Jr., Wenger AD, McNair LD, & Tangorra JL (2014). College and nonprofit industry partnership: Coupling undergraduate projects with K-12 outreach program to enhance engineering education. Paper presented at the ASEE Annual Conference & Exposition, Indianapolis, IN.
- Soto-Greene M, Wright L, Gona OD, & Feldman LA (1999). Minority enrichment programs at the New Jersey Medical School: 26 years in review. *Academic Medicine*, 74(4), 386–389. doi:10.1097/00001888-199904000-00032 [PubMed: 10219218]
- Stevens DD (1999). The ideal, real and surreal in school – university partnerships: Reflections of a boundary spanner. *Teaching and Teacher Education*, 15(3), 287–299. doi:10.1016/S0742-051X(98)00017-1
- Tobias B, Glazer G, & Mentzel T. (2018). An academic-community partnership to improve health care workforce diversity in greater Cincinnati: Lessons learned. *Progress in Community Health Partnership*, 12(4), 409–418. doi:10.1353/cpr.2018.0066
- Tomkins A, Zhang M, & Heavlin WD (2017). Reviewer bias in single-versus doubleblind peer review. *Proceedings of the National Academy of Sciences*, 114(48), 12708–12713. doi:10.1073/pnas.1707323114
- Tytler R, Symington D, & Clark JC (2017). Community-school collaborations in science: Towards improved outcomes through better understanding of boundary issues. *International Journal of Science and Mathematics Education*, 15(4), 643–661. doi:10.1007/s10763-015-9711-9
- Tytler R, Symington D, Williams G, & White P. (2018). Enlivening stem education through school-community partnerships In Jorgensen R. & Larkin K. (Eds.), *Stem education in the junior secondary: The state of play* (pp. 249–272). Singapore: Springer Verlag.
- Tytler R, Symington D, Williams G, White P, Chittleborough G, Upstill MG, Dziadkiewicz MN (2015). Building productive partnerships for STEM education. Victoria, Australia: Deakin University Retrieved from <https://core.ac.uk/display/33207165>
- Willems PP, & Gonzalez-DeHass AR (2012). School-community partnerships: Using authentic contexts to academically motivate students. *School Community Journal*, 22(2), 9–30.
- Wohlstetter P, Malloy CL, Chau D, & Polhemus JL (2003). Improving schools through networks: A new approach to urban school reform. *Educational Policy*, 17(4), 399–430. doi:10.1177/0895904803254961
- Wrensford GE, Stewart K-A, & Hurley MM (2019). A health professions pipeline for underrepresented students: Middle and high school initiatives. *Journal of Racial and Ethnic Health Disparities*, 6(1), 207–213. doi:10.1007/s40615-018-0515-9 [PubMed: 30014447]
- Wyandotte County still no. 99 on health rankings list. (2019, 3 19). *Wyandotte Daily*. Retrieved from <http://wyandottedaily.com/wyandotte-county-still-no-99-on-health-rankings-list/>



 <p>Practice appreciative inquiry All parties learn about and from each other. Knowledge transfer is multidirectional.</p>	 <p>Balance Power All parties make concessions, investments, offer assets, and expect benefits from the partnership.</p>
 <p>Designate navigators Each institution identifies navigators who are well-positioned to influence others and whose partnership role aligns with their current organization role.</p>	 <p>Increase Connectivity Partners reach beyond their specific disciplines to achieve the goals of the partnership.</p>
 <p>Institutionalize opportunity Clear policies and procedures are made official to facilitate sustainability and transparency.</p>	 <p>Maximize visibility Appropriate offices increase awareness of leadership commitment to the partnership, publicize connections to institutional goals, and publicly celebrate accomplishments.</p>

Figure 1.
KU Health Science Academy Model

Table 1:

Key Stakeholders

KU Health System	Kansas City Kansas Public Schools	University
VP of Operations	Director of Diploma+	Executive Vice-chancellor
Chief Culture Officer	Director of Career and Technical Education (CTE)	Executive Vice-chancellor’s Office
Director of Patient- and Family-centered Services	Science curriculum specialist	Director of the Office of Diversity and Inclusion (ODI)
Director of Nursing Education	CTE curriculum coordinator	—
Support positions’ department heads	Health Science teachers	—
Director of Marketing and Communication	—	—
Police and Public Safety	—	—

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Table 2:

Timeline of Partnership Formation

Fall 2017	KU receives request from KCKPS CTE Director for assistance in developing healthcare industry partnerships.
Spring 2018	KU faculty, staff, Executive Vice Chancellor, and leaders from the University Health System (i.e. Vice President of support operations, community liaison) meet to define interest. EVC, Health System, and school district representatives (see Table 1) meet to define needs, interest, and goals.
Summer 2018	The university legal team contacts the district to start drafting an agreement to institutionalize the partnership.
Fall 2018	Key players/institutional navigators are identified at the district office, participating schools, university, and health system. Health Science teachers, district curriculum directors, health system representatives, and university faculty meet 5 times to develop a curriculum aligned with competencies, standards, and workforce needs. Faculty receive requests to teach in the academy. All parties sign the contract. Transportation and space are secured
Spring 2019	Inaugural Class is launched and completes the Health Science Academy.

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Table 3:

Curriculum Overview

Unit 1: Hidden Carriers in Health	<i>Session 1:</i> Workforce panel
Lead: UKHS	<i>Session 2:</i> HIPPA
Unit 2: CPR	<i>Session 3:</i> Hospital tour, support positions
Lead: UKHS	<i>Session 4:</i> Auditing a hospital room: ATP test
Unit 3: Nursing	<i>Sessions 1–4:</i> American Heart Association (AHA) certification
Lead: School of Nursing (SON)	<i>Session 1:</i> Nursing specialties
	<i>Session 2:</i> Nursing in the community
	<i>Session 3:</i> Stroke identification and Clinical Skills Lab
	<i>Session 4:</i> Midwifery and STDs
Unit 4: Laboratory Science	<i>Session 1:</i> Clinical Laboratory Sciences Panel
Leads: Clinical Laboratory Science, and Kansas IDeA Network of Biomedical Research Excellence (K-INBRE)	<i>Session 2:</i> Lab safety and performing a lab audit
	<i>Session 3:</i> DNA Necklace Lab
	<i>Session 4:</i> Histology and imaging
Unit 5: Community-Based Research	<i>Session 1:</i> Community health research
Lead: Population Health Department	<i>Session 2:</i> Community health research methods
	<i>Session 3:</i> Community health research in action
	<i>Session 4:</i> Community health workers
Unit 6: Creating a Career Portfolio	<i>Session 1:</i> Exploring job availability
Lead: UKHS	<i>Session 2:</i> Developing your CV
	<i>Session 3:</i> Mock interviews