# VIRGINIA ASCD

Learn. Teach. Lead.

# JOURNAL 2020

VASCD 2020 Vision

**2020 ANNUAL CONFERENCE**
**ONLINE DEC 2 - 3**

VIRGINIA ASCD
Learn. Teach. Lead.

## Board of Directors
### Officers 2020 - 2021

| | |
|---|---|
| President | Alan Seibert, Salem |
| Past President | Robin Hoffman, Virginia Beach |
| Treasurer | Pat Griffin, Virginia Beach |
| Parliamentarian/Historian | Tom Debolt, Albemarle |
| Secretary | Jennifer Orr, Fairfax |

## Committee Chairs

**Governance • Tom DeBolt, Albemarle**
*The Governance Committee ensures ethical, responsible leadership and continuous learning within VASCD.*

**Conference • Melissa George, Virginia Beach**
*The Conference Committee designs and executes Virginia's premier annual conference on teaching and learning.*

**Programs • Chris Jones, Chesterfield**
*The Programs Committee guides VASCD's professional learning activities to ensure high quality and positive impact.*

**Awards and Grants • Ebbie Linaburg, Shenandoah and Julie Myers, Frederick**
*The Awards Committee creates criteria and oversees selection of VASCD's Impact and Leadership Awards as well as grants to support innovation in schools.*

**Advocacy • Daniel Smith, Fairfax and Joe Douglas, Colonial Heights**
*The Advocacy Committee works to influence state education policy in the interest of students and teachers.*

**Resource • Pat Griffin, Virginia Beach**
*The Resource Committee establishes and monitors VASCD's budget and ensures responsible fiscal management.*

VASCD's Journal Editor is Eric Carbaugh, James Madison University

# Table of Contents

## ARTICLES

# Induction Into the Great Unknown: Supporting Newly Hired Science and Mathematics Teachers During the COVID-19 Pandemic

***Induction programs can support newly hired teachers during a phase of transition and continued learning, but what happens when the contexts for which newly hired teachers were prepared—and induction support was planned—are fundamentally reshaped by the COVID-19 pandemic? The leadership team of James Madison University's Robert Noyce Teacher Scholarship Program faced this pressing question when planning a summer induction academy for newly-graduated Noyce Scholars who were starting their teaching careers amid the uncertainty of the pandemic. This article introduces the JMU Noyce Program, discusses plans for a summer induction academy, and details changes to those plans in response to the ever-changing realities of school reopening plans. Key takeaways from planning and facilitating a summer induction academy amid a global pandemic that can inform the work of others supporting the induction and success of newly hired teachers this fall are discussed.***

**Angela W. Webb, Ph.D.**

*Angela W. Webb, Ph.D., is an associate professor of science education in the College of Education at James Madison University where she teaches graduate and undergraduate science methods courses and internship seminar. Her scholarship centers on the preparation and early career development of secondary science teachers, with a specific focus on meaning making and identity development during induction. She has provided professional development on inquiry, the nature of science, project-based learning, and co-teaching in science to middle and high school science teachers. Before earning her Ph.D., she taught high school biology, physical science, and AP Environmental Science. Connect through Twitter @angelawwebb or* **webbaw@jmu.edu**

**Robbie Higdon, Ph.D.**

*Dr. Robbie Higdon, **higdonrl@jmu.edu,** teaches general instructional methods and supervises field experiences in grades 6-12 at James Madison University in Harrisonburg, VA. Her research focus includes pre-service teacher identity development and the recruitment and retention of science educators in grades 6-12. She also mentors pre-service teachers in the development and implementation of STEM outreach activities within local schools and community agencies.*

**Eric J. Pyle, Ph.D.**

*Eric J. Pyle is a professor of geology at James Madison University, specializing in geoscience education and teacher preparation. Over the last 28 years, he has published on science teacher preparation and professional development as well as instructional materials development and evaluation. He has served in the leadership of six NSF-funded projects, including grants for GK-12 Teaching Fellows, geoscience education, and the Robert C. Noyce program. He was the co-chair of the committee drafting the 2020 NSTA/ASTE Standards for Science Teacher Preparation. He has served as President of both the West Virginia Science Teachers Association (WVSTA) and the Virginia Association of Science Teachers (VAST), and currently serves as the President-Elect of the National Science Teaching Association (NSTA).*

Graduating from a teacher education program and standing on the cusp of entering your own classroom is typically both an exciting and fraught time for newly hired teachers. For recently graduated Scholars of the James Madison University Robert Noyce Teacher Scholarship Program, however, this current time is further complicated by the still-unfolding COVID-19 pandemic and school divisions' ever-changing reopening plans.

The Robert Noyce Teacher Scholarship Program, funded by the National Science Foundation (n.d.), "seeks to encourage talented science, technology, engineering, and mathematics (STEM) majors and professionals to become K-12 mathematics and science…teachers" (Synopsis section). To realize this goal, JMU's Robert Noyce Teacher Scholarship Program (from here forward, JMU Noyce Program) has three specific, yet interrelated goals:

1. To expand recruitment and retention efforts for secondary science and mathematics pre-service teachers;

2. To support student development as secondary science and mathematics pre-service teachers through high-quality teacher education programs and co-curricular activities and interdisciplinary learning experiences focused on enhancing understanding of the nature of science and mathematics, identifying the most qualified science and mathematics teaching candidates for support as Noyce Scholars; and

3. To support Noyce Scholars' development as effective and ambitious teachers at the start of their teaching careers through mentoring and other professional engagement structures, such as professional learning communities.

This article focuses on efforts by the JMU Noyce Program leadership team related to the third goal of providing induction support for our graduated Noyce Scholars.

The JMU Noyce Program faculty includes scientists, mathematicians, and teacher educators who care deeply about secondary science and mathematics education and educators. Half of the JMU Noyce Program leadership were K-12 teachers before becoming higher education faculty, and all of us bring to our

work an enthusiasm for promoting the teaching profession and supporting science and mathematics teachers along the career trajectory. This care and commitment came to the fore this summer as we planned, pivoted, and pressed on in order to provide meaningful support during a summer induction academy to our newly graduated group of Noyce Scholars as they entered their first year of teaching in uncharted territory. Although each member of project leadership seeks for our Noyce Scholars to be as successful as possible in their new positions, we were forced to reconsider our roles and responsibilities when the contexts for which newly hired teachers were prepared—and induction support was planned—were fundamentally altered by the global COVID-19 pandemic.

## Teacher Induction

Along the career trajectory, teachers never stop learning as "practical intellectuals, curriculum developers, and generators of knowledge in practice" (Feiman-Nemser, 2001, p. 1015). Therefore, it is no surprise that, even with the best preparation, newly hired teachers must gain significant knowledge and skills on the job as they shift from being students of teaching to teachers of students (Bartell, 2005). During the induction phase of their careers, newly hired teachers grapple with gaining knowledge of their students, curriculum, and school contexts; designing and implementing responsive curriculum and instruction; enacting a beginning repertoire of practice in purposeful ways; creating a classroom learning community; and developing a professional identity (Feiman-Nemser, 2001, pp. 1027-1029). It is easy to see how this phase of their careers can be overwhelming to newly hired teachers (Curry, Webb, & Latham, 2016; Feiman-Nemser, 2003); yet, school and division administrators, mentors, and university-based teacher educators are uniquely positioned to support newly hired teachers for better beginnings in the profession.

Since induction can be thought of as a phase in learning to teach and a process of socialization (Feiman-Nemser, 2010), we must acknowledge that newly hired teachers are inducted into the teaching profession even in the absence of intentional or formal induction supports and programs (Feiman-Nemser, 2010). Fortunately, there has been a steady increase in recent decades in the numbers of newly hired teachers receiving induction support through formal programs (Ingersoll, 2012; Smith & Ingersoll, 2004). Although induction programs are widely varied, working with a mentor teacher in the same subject area and having common planning or collaboration time with subject-area colleagues are shown to have the strongest effect on teacher retention (Ingersoll, 2012).

## Induction Support through the JMU Noyce Program

Content-specific induction and mentoring are key to helping newly hired teachers succeed in their initial years on the job (Luft et al., 2011; Wong & Luft, 2015), and this is what we planned for the Noyce Scholars. By engaging Noyce Scholars in science- and mathematics-focused induction and mentoring, the JMU Noyce Program is uniquely positioned to support newly hired science and mathematics teachers from our program to

1. Confront and revise/refine beliefs in relations to good practice;
2. Reinforce subject matter instruction;
3. Examine student learning in the content area;
4. Strengthen skills and dispositions to study and improve teaching;
5. Build and enact a beginning repertoire [of practice]; [and]
6. Develop a professional identity. (Luft, Wong, & Semken, 2011, p. 461)

To foster such learning and development in the newly hired Noyce Scholars, we designed our induction support to provide a structured transition from full-time student to full-time professional educator through an embedded, sustained program beginning in the summer semester immediately following the Scholars' completion of their Master of Arts in Teaching degree and teacher licensure program. Specifically, Noyce Scholars are supported by a professional mentor, who has frequent and direct contact with the Scholar, to assist their instructional development and reflective practice. Scholars participate in a summer induction academy and, during their first and second years of teaching, will continue to engage in a cohort-based professional learning community (PLC) that was started upon their acceptance into the Noyce Program. As a whole, this induction program provides targeted support and professional development through Scholars' first year of teaching and the following summer to provide ongoing support while capitalizing upon the relationships established with Scholars during their teacher preparation program. It is our belief that a program where a new teacher has a well-defined community of support consisting of partners with whom this teacher has an existing relationship will help that teacher become a more reflective practitioner and persist in the field. Figure 1 on the following page outlines the various stages of induction support provided to JMU Noyce Scholars.

### JMU Noyce Summer Induction Academy

As originally planned, the summer induction academy was to be on campus, in person, and open to any early-career (0-2 years of experience) science and mathematics teacher, regardless of their participation in the JMU Noyce Program, with Noyce Program faculty serving as session instructors. When the university made its decision to make all summer classes online, this affected the delivery mode of our summer academy and we transitioned our efforts and activities to be web-based on Canvas (our learning management system) and Zoom. Since

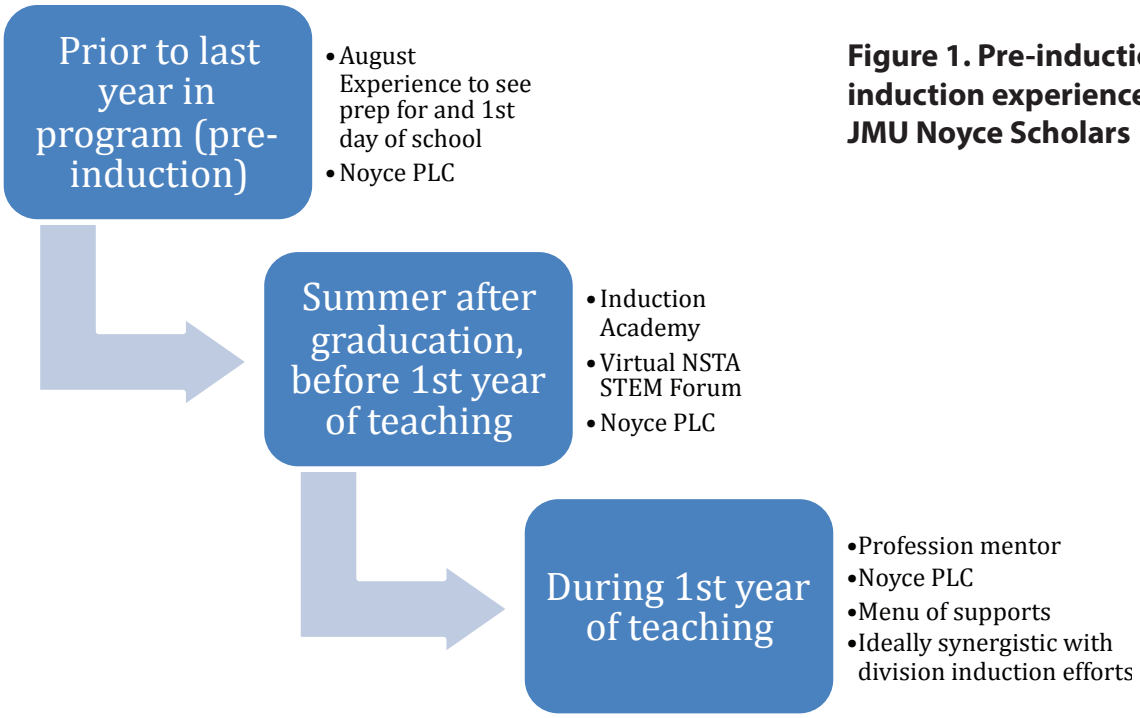


**Figure 1. Pre-induction and induction experiences for JMU Noyce Scholars**

we needed to transition to Canvas to facilitate our virtual sessions, we had to limit participation to JMU Noyce Scholars.

Based on the knowledge and skills Scholars developed in their teacher education program, national trends in how well prepared science and mathematics teachers felt for various tasks (e.g., develop students' conceptual understanding, encourage participation of all students in science/mathematics, provide science/mathematics instruction that is based on students' ideas [Banilower et al., 2018]), and best practices for supporting newly hired science and mathematics teachers (Ingersoll, 2012; National Council of Teachers of Mathematics, 2013; National Science Teaching Association, 2019; Wong, 2004), we outlined the big ideas for each of three online modules:

1. Planning and organization of big conceptual ideas and physical space (classroom and lab), including scope and sequence of big conceptual ideas across the semester/year, hooking students' initial interest and pre-

assessing their initial understanding in meaningful ways, course syllabi, plans for first day of school, and plans for first two weeks of school

2. Disciplinary discourse and sensemaking, including establishing class norms, implementing practices for productive disciplinary discourse, eliciting and building on students' ideas, helping students review their thinking, and fostering sensemaking
3. Reflective practice and professional development

Each of these three modules was a day (5-6 hours per day) of the online summer induction academy and included synchronous and asynchronous learning activities facilitated by Zoom and Canvas as well as tangible products for the Scholars to use for the start of the school year. Table 1 includes a list of tangible products that Scholars developed during each module. A fourth module was planned as an ongoing and open Canvas discussion forum for Scholars to post pressing questions and share useful ideas and resources. As Scholars start teaching, this fourth module will also be a place for just-in-time resources.

**Table 1: Tangible Products from the Summer Induction Academy**

| Module Topic | Tangible Products |
|---|---|
| **Planning and organizing** | • Sequence of conceptual units for course(s)<br>• Plans for meaningful pre-assessment<br>• Outline of syllabus, including safety plans for science<br>• Plan for first day of school, including building community<br>• Outline of plans for first two weeks of school |
| **Discourse and sensemaking** | • Specific plans for establishing class norms<br>• Specific strategies and activities for:<br>  ○ Eliciting students' science/math ideas<br>  ○ Building on students' science/math ideas<br>  ○ Helping students revise their science/math thinking<br>  ○ Promoting sensemaking of big science/math ideas |
| **Reflective practice and professional development** | • Professional development plan for the first semester |

## Responsive Induction Support Amid a Pandemic

The summer induction academy took place July 27-30, 2020. Our shift from a face-to-face summer induction academy to a fully virtual one was due to the COVID-19 pandemic; however, just that change alone does not fully capture the ways in which we were responsive to Scholars' needs and the ever-changing teaching contexts they would enter as schools planned to reopen amid the pandemic. Table 2 on the following page outlines the summer academy and summarizes our important shifts in response to the pandemic.

### Discussion and Reflection Opportunities

Within each Zoom session, we intentionally provided multiple opportunities for our scholars to read, reflect, and discuss how they would establish classroom norms, select appropriate instructional strategies, elicit students' ideas, and actively engage students in sensemaking—all while navigating a continually changing educational environment. During each day of the induction program, different members of the JMU Noyce leadership team facilitated instruction based upon their areas of expertise, giving our Scholars access to multiple perspectives on teaching and learning. On Canvas and in the synchronous Zoom sessions, we were able to demonstrate several important practices (e.g., eliciting students' ideas using Chat, encouraging participation with Polls) and test out online or digital tools (e.g., **Pinup, GeniusScan**) in response to Scholars' questions and wonderings.

Unsurprisingly, Scholars asked some of the same questions and raised some of the same issues that we, ourselves, had grappled with in the spring semester during the emergency pivot of our courses online, so we were able to share our direct experiences, solutions, and still-lingering questions and concerns. For instance, several Noyce faculty struggled with clear ways for students to turn in visuals, such as graphs, when JMU's spring classes went online. Having students

**Table 2: Shifts in the Summer Induction Academy in Response to the Pandemic**

| Module Topic | Initial Focus | Shifted Focus |
|---|---|---|
| **Planning and organizing (Mon., July 27)** | • Physical arrangement of classroom, including lab space<br>• Detailed scope and sequence of big disciplinary ideas focus on<br>• Hooking students and generating interest in course content | • Virtual setup in Learning Mangement System (LMS); structures within LMS to foster learning<br>• How to pre-assess students virtually related to conceptual understanding, experiences with blended and virtual learning, & technology access<br>• Establishing strong hybrid or virtual learning community |
| **Discourse and sensemaking (Tues., July 28)** | • Negotiating norms for participation<br>• Facilitating disciplinary discourse<br>• Using student representations of their thinking as an entry point for sensemaking | • Using online tools to negotiate norms of participation<br>• Anticipating, monitoring, selecting, sequencing, & connecting students' ideas across synchronous & asynchronous contexts to foster productive discourse<br>• Online and digital tools for students to represent their thinking and share it with others |
| **NSTA virtual STEM forum (Wed., July 29)** | *This was not an original component of the summer induction academy* | • Learning from others' experiences & expertise regarding teaching science & mathematics in virtual or blended learning environments<br>• Engaging in syn-COVID PD activities & with professional organizations |
| **Reflective practice and professional development (Thurs., July 30)** | • Professional development plan<br>• Continued licensure requirements | • Reflecting on NSTA virtual event<br>• Situating professional development plan on immediate learning need identified from NSTA event<br>• Advocacy work of Harrisonburg Education Association/Virginia Education Association amid pandemic |
| **Ask Anything, Share Good Stuff Canvas discussion forum (ongoing)** | • A space for Scholars to ask questions as they came up during asynchronous activities or after the summer induction academy<br>• A space for Scholars to share with others any useful resources they come across | • This specific focus did not change; however, the nature of questions asked and resources shared surely has<br>• This space on Canvas will shift to also include just-in-time resources once the fall semester begins |

take and upload to Canvas a picture of their graph or other representation did not always result in clear images. We shared these obstacles with the Scholars and brainstormed alternatives, such as using GeniusScan for capturing images, as PDFs, of student work. Additionally, since JMU's summer courses were moved online, Angela (first author) had experience establishing a fully virtual learning community and using **Dotstorming** to negotiate norms for synchronous and asynchronous discussions and interactions. She was able to talk about this process and show this tool to the Scholars.

**National Science Teaching Association Virtual Event**

To foster a mindset focused on continued learning and professional development, we took advantage of a rare event that coincided with our summer academy, the rescheduled **National Science Teaching Association (NSTA) STEM Forum**. Normally held in late June as a face-to-face event, the Forum supports presentations that integrate STEM disciplines and showcases the best of recent innovations in STEM pedagogy and pedagogical content knowledge. Closures and travel restrictions forced the cancellation of the face-to-face event for 2020, but NSTA was eager to maintain the professional development opportunity, pivoting to an online format and reorganizing the program such that each day represented a different grade-band, with the high-school level on the third day (of the NSTA event and, coincidentally, our summer induction academy). Presentations were made available through on-demand video, with a limited number of synchronous sessions with live Q&A. A deliberate effort was made by NSTA to provide models for distance-learning and hybrid online/face-to-face instruction.

Leveraging this timely opportunity for professional learning and networking that was geared toward the forming realities of fall reopening, we integrated this virtual NSTA event as the third day of our summer induction academy.

This opportunity came after two days focused on planning for and organizing virtual and blended learning environments, fostering community virtually, and facilitating and fostering sensemaking in virtual and blended learning environments; and before our module focused on reflective practice and professional development. Scholars were directed to participate in at least two sessions dealing with virtual or blended instruction, and at least two sessions of their choosing. They were provided with a series of reflective prompts to help guide them in their analysis of the content and potential application of the various breakout sessions relative to their anticipated teaching assignments. Specifically, they were asked to reflect upon how the strategies might be incorporated into their instruction, as well as generate further questions they had regarding the various strategies.

**Modeling Responsiveness**

Implicitly and explicitly, our virtual summer induction academy modeled for Scholars how they could address key issues and activities related to teaching and learning in blended and virtual learning environments. We also modeled being responsive to students' emotional and learning needs. For instance, in the weeks leading up to our summer academy, Scholars communicated to us through informal channels (i.e., **GroupMe**) that they felt school reopening plans—specifically the national narrative around these plans—disregarded the health and lives of school staff. They wondered who advocated on behalf of teachers (and subsequently students) for safe, science-based school reopening plans. In response to these concerns, we invited the president of our local chapter of the Virginia Education Association (VEA) to join the Zoom meeting on our professional development-focused day to talk about the organization in general and the advocacy work VEA has done specific to the COVID-19 pandemic. To conclude the summer induction academy, we engaged the scholars in a review of general licensure renewal guidelines and in the development of a

professional development plan based upon one of the questions they posed after participating in the STEM Forum event the previous day.

## Takeaways for Supporting Newly Hired Science and Mathematics Teachers This Fall

Our work supporting newly hired science and mathematics teachers through JMU's Noyce Program has implications for the ways we approach and facilitate induction support for newly hired science and mathematics teachers during the still-unfolding COVID-19 pandemic. Several of the lessons we learned from our just-in-time modifications and responsiveness to the reshaped realities our Scholars now face may be useful to school and division administrators, mentors, and university faculty who support newly hired teachers during this critical and formative time of their careers.

### Flexibility

Just as teachers are adapting their instruction, those of us who support teachers, especially newly hired teachers, may have to adapt our typically hands-on support. Above, we described these adaptations in the context of the JMU Noyce Program's summer induction academy. Likely, the summer academy will not be the only aspect of our Noyce induction plans that will be affected by the pandemic. We will need to remain open-minded and flexible about PLC activities and mentoring, too. Our future PLC meetings will be held via Zoom and our Scholars and their mentors may engage in dialogue over video observations using programs like **GoReact** or **VideoAnt.**

### Responsiveness

Planning for the summer induction academy started well before this summer. Yet, the reality of schools and contexts for teaching and learning that we were thinking our Scholars might enter do not currently exist. Rather than abandoning

our summer induction plans altogether and relinquishing our responsibility for supporting Scholars for better beginnings in the profession, we decided to meet the moment head on. This meant stopping to acknowledge the unknown and uncertain realities our Scholars would face in the fall and grappling with the anxiety and unrest this caused. If we had not done this, their raised affective filters (Krashen, 1982) may have hindered any professional learning we hoped would happen during the summer academy. Centering the Scholars' feelings and well-being also modeled how they could do this with their students.

**Discipline Specific**

Even during non-pandemic times, we need to provide embedded, ongoing, content-specific induction strategies when supporting newly hired science and mathematics teachers. This "illuminates the role of content in learning to teach, as well as in the process of supporting new teachers" (Luft et al., 2015, p. 198). Amid the pandemic, each discipline faces unique challenges in translating face-to-face, in-person instruction to blended and virtual learning environments. In science and mathematics, we have to grapple with effective and efficient ways for students to represent their ideas and engage with the big ideas of our disciplines in meaningful, authentic ways. Discipline-specific induction and mentoring allow newly hired science and mathematics teachers to grapple and get support with how students can, for example, engage in inquiry, create and share graphs of data remotely, or show their work in a way that avoids additional burdens on students and teachers and is feasible to use in the face of varying access to technology.

**Relationships and Community**

Importantly, but not surprisingly, the critical value of relationships was reinforced during our summer induction academy. Teachers' relationships with administrators, colleagues, and mentors can be growth-fostering or growth-

hindering (Miller, 1986; Webb, 2018); the same is true for student-teacher relationships and the communities cultivated and nurtured in classrooms. In the context of these relationships, mattering matters a great deal. Specifically,

**Mattering is a crucial component of relational resilience... This is important to both teachers and students during a typical school year—even more so amid the uncertainty and anxiety of the COVID-19 pandemic.**

"mattering implies that people invest in us because they are sincerely interested in furthering our welfare" (Elliot et al., 2005, p. 224). Mattering is a crucial component of relational resilience, which is "the ability to connect, reconnect, and resist disconnection in response to hardships, adversities, trauma, and alienating social/cultural practices" (Hartling, 2010, p. 54). This is important to both teachers and students during a typical school year—even more so amid the uncertainty and anxiety of the COVID-19 pandemic. Our aims related to community and relationships during the summer induction academy were two-fold: to further nurture the community among our Noyce Scholars and between the Scholars and JMU Noyce Program faculty, and to emphasize the importance of building and fostering a learning community in the blended and virtual spaces in which our Scholars would be teaching this fall.

## Conclusion

At the time of writing, there remains a bewildering array of considerations for teachers in general, returning to teaching this fall in the midst of the COVID-19 pandemic. Will instruction be in person or online, or a blend of these? What

thresholds are defined for changing the mode of instruction once the school year is underway? These questions are daunting enough for experienced teachers, yet represent the new and unknown world facing recent teacher education graduates. The JMU Noyce Program was designed to provide not only preparation for science and mathematics teachers, but also to foster a measure of resilience in dealing with commonplace teaching concerns as well as unforeseen problems. Helmuth von Moltke the Elder (1880) stated, "No plan of operations reaches with any certainty beyond the first encounter with the enemy's main force" (as quoted in Hughes, 1993, p. 92). The "enemy" in this case is a virus that has upended the system into which our Noyce Scholars, like all newly hired teachers, will be entering. Yet through our pivot to a virtual summer induction academy, we believe the groundwork has been set to respond to the challenges that lay ahead, both for our Noyce Scholars and the framework through which their induction into the teaching profession will continue over the next two years.

## Acknowledgements

This material is based upon work supported by the National Science Foundation under Grant No. 1758433. Any opinions, findings, and conclusions or recommendations expressed in this material are those of the author(s) and do not necessarily reflect the views of the National Science Foundation.

We gratefully acknowledge our colleagues with the JMU Robert Noyce Scholarship Program for their contributions to this project and their advocacy and support of science and mathematics teacher education (in alphabetical order): David Carothers, Kerry Owens Cresawn, Scott Paulson, Barbara Reisner, Mike Renfroe, Anthony Tongen, and David Wilson.

## References

Banilower, E. R., Smith, P. S., Malzahn, K. A., Plumley, C. L., Gordon, E. M., & Hayes, M. L. (2018). *Report of the 2018 NSSME+*. Horizon Research, Inc.

Bartell, A. C. (2005). *Cultivating high-quality teaching through induction and mentoring*. Corwin Press.

Curry, J. R., Webb, A. W., & Latham, S. J. (2016). A content analysis of images of novice teacher induction: First semester themes. *Journal of Educational Research and Practice, 6*(1), 43-65. **https://scholarworks.waldenu.edu/jerap/vol6/iss1/4/**

Elliot, G. C., Colangelo, M. F., & Gelles, R. J. (2005). Mattering and suicide ideation: Establishing and elaborating a relationship. *Social Psychology Quarterly, 68*(3), 223–238.

Feiman-Nemser, S. (2001). From preparation to practice: Designing a continuum to strengthen and sustain teaching. *Teachers College Record, 103*(6), 1013-1055.

Feiman-Nemser, S. (2003). What new teachers need to learn. *Educational Leadership, 60,* 25-29.

Feiman-Nemser, S. (2010). Multiple meanings of new teacher induction. In J. Wang, S. Odell, & R. Clift (Eds.), *Past, present and future research on teacher induction: An anthology for researchers, policy makers and practitioners* (pp. 15-30). Rowan & Littlefield.

Hartling, L. M. (2010). Strengthening resilience in a risky world: It's all about relationships. In J.V. Jordan (Ed.), *The power of connection: Recent developments in relational–cultural theory* (pp. 49–68). Routledge.

Hughes, D. J, (Ed.). (1993). *Moltke on the art of war: Selected writings.* Presidio Press.

Ingersoll, R. (2012). Beginning teacher induction: What the data tell us. *Phi Delta Kappan, 93*(8), 47–52.

Ingersoll, R. M., Strong, M. (2011). The impact of induction and mentoring programs for beginning teachers: A critical review of the research. *Review of Education Research, 81*(2), 201-233.

Krashen, S. D. (1982). *Principles and practices in second language acquisition.* Pergamon.

Luft, J. A., Dubois, S. L., Banilower, E. R., Campbell, B. J., Criswell, B. A., Donna, J. D., Firestone, J. B., Greisen, K., Henschel, M. M., Hill, K. M., McDonnough, J. T., Merk, H., Nixon, R. S., Richmond, G., Roehrig, G. H., Rushton, G. T., Stoupe, D., Webb, A. W., Windschitl, M., & Wong, S. S. (2015). Connecting research to practice for better beginnings: Drawing upon what we know to enhance the teaching and learning of newly hired science teachers. In J. A. Luft & S. Dubois (Eds.) *Newly hired teachers of science: A better beginning* (pp. 197-203). SensePublishers.

Luft, J. A., Firestone, J. B., Wong, S. S., Ortega, I., Adams, K., Bang, E. (2011) Beginning secondary science teacher induction: A two-year mixed methods study. *Journal of Research in Science Teaching, 48*(10), 1199–1224.

Luft, J. A., Wong, S. S., & Semken, S. (2011). Rethinking recruitment: The comprehensive and strategic recruitment of secondary science teachers. *Journal of Science Teacher Education, 22*(5), 459-474.

Miller, J. B. (1986). *Toward a new psychology of women* (2nd ed.). Beacon Press.

National Council of Teachers of Mathematics. (2013). *Position statement: Teacher mentorship.* **https://www.nctm.org/Standards-and-Positions/Position-Statements/Teacher-Mentorship/**

National Science Foundation. (n.d.). *Robert Noyce Teacher Scholarship Program.* **https://www.nsf.gov/funding/pgm_summ.jsp?pims_id=5733&org=NSF**

National Science Teaching Association. (2019). *Position statement: Induction programs for the support and development of newly hired teachers of science.* **https://www.nsta.org/nstas-official-positions/induction-programs-support-and-development-newly-hired-teachers-science**

Smith, T. M., & Ingersoll, R. M. (2004). What are the effects of induction and mentoring on beginning teacher turnover? *American Educational Research Journal, 41*(3), 681–714.

Webb, A.W. (2018). Relational-Cultural Theory and teacher retention: A case study of relationships and resilience in secondary mathematics and science teachers. *Journal of Educational Research and Practice, 8*(1), 1-18. **https://scholarworks.waldenu.edu/cgi/viewcontent.cgi?article=1211&context=jerap**

Wong, H. K. (2004). Induction programs that keep new teachers teaching and improving. *NASSP Bulletin, 88*(638), 41-58.

Wong, S. S., & Luft, J. A. (2015). Secondary science teachers' beliefs and persistence: A longitudinal mixed-methods study. *Journal of Science Teacher Education, 26*(7), 619-645.