

Support the Acceleration of Virtual Education for K-12 (SAVE K-12)

This review was written based on the Support the Acceleration of Virtual Education for K-12 (SAVE K-12) workshop. The conference was supported by the United Engineering Foundation (UEF).



We would like to thank members of the United Engineering Foundation for their participation and support in this interdisciplinary workshop.

Key Workshop Findings (summarized from talks):

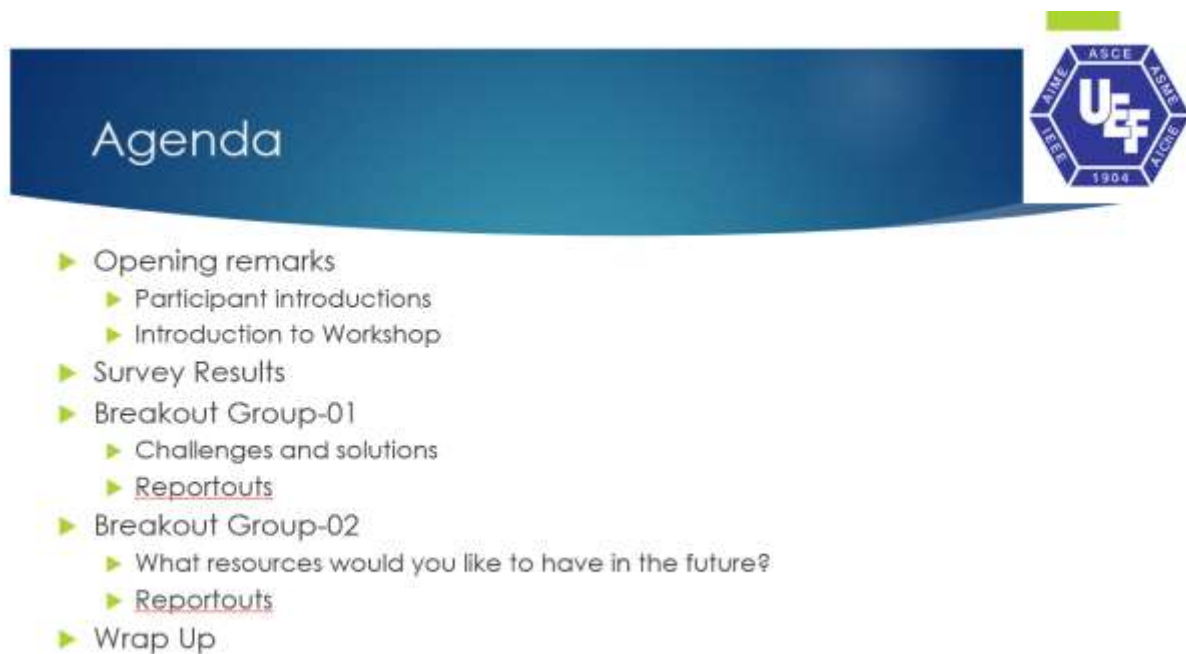
From our discussions, we found that many K-12 instructors did not find the transition to virtual education particularly challenging, as virtual resources have been slowly incorporated into the curriculum in the past few years, therefore easing the transition. However, there were several challenges that arose, namely encouraging student engagement, difficulty of students engaging with content when using asynchronous materials (as opposed to live lessons), and students experiencing a difficult time adjusting when there are multiple different platforms being used within a school year or for one class. Therefore, it is vital to be selective when choosing virtual resources and platforms, in order to avoid utilizing numerous platforms causing a distraction from the content students will need to learn. Additionally, when asked about their priorities in choosing virtual education platforms, the primary concern for K-12 instructors were the interactive capabilities of the platform, and the ability to allow for collaboration among students. Cost remains an issue as well, as various school districts cannot pay for licenses for various software applications.

K-12 instructors have adapted various tools for their classrooms during the pandemic, namely Google Classroom, Sprocket, Nearpod, PhET simulations, Concord Consortium simulations, COMSOL, and more. Surprisingly, there were not many platforms used specifically for virtual laboratories adapted by K-12 instructors. This is primarily due to a number of factors, including lack of awareness about the options available, many options targeted to only the higher education level, and lack of modules and lessons available for K-12 instructors to use in their lessons. For

the future, expanding these resources will be necessary to ensure an interactive laboratory experience.

Most K-12 instructors agree that virtual education will continue to be a component in the future after the pandemic. Virtual education is useful for students who need to take extended absences. However, even with a virtual education platforms available, hands on projects are vital to teaching concepts and encouraging innovation for students. Therefore, experiments students can do from home coupled with live communication from instructors on platforms such as Google Classrooms will provide a helpful supplement for in-person learning. This will ensure students don't miss out on learning interaction skills as well.

Program:

The slide features a dark blue header with the word "Agenda" in white. To the right of the header is the University of Florida logo, which is a purple hexagon with "U&F" in white, surrounded by "ASCE", "ASME", "IEEE", and "ATCIS" in a circular arrangement, with "1904" at the bottom. Below the header, the agenda items are listed in a bulleted format with green arrowheads. The items are: Opening remarks (with sub-bullets for Participant introductions and Introduction to Workshop), Survey Results, Breakout Group-01 (with sub-bullets for Challenges and solutions and Reportouts), Breakout Group-02 (with sub-bullets for What resources would you like to have in the future? and Reportouts), and Wrap Up.

- ▶ Opening remarks
 - ▶ Participant introductions
 - ▶ Introduction to Workshop
- ▶ Survey Results
- ▶ Breakout Group-01
 - ▶ Challenges and solutions
 - ▶ Reportouts
- ▶ Breakout Group-02
 - ▶ What resources would you like to have in the future?
 - ▶ Reportouts
- ▶ Wrap Up

A survey was conducted to outline information about these virtual learning tools for attendees who would like more resources prior to the workshop.

Survey Results



- ▶ Surveyed educators — 9 total responses
- ▶ Questions:
 - ▶ What new resources have you introduced into your classroom to enhance the experience of virtual/hybrid learning?
 - ▶ If you teach a lab class, what resources are you using?
 - ▶ What do you like most about these resources?
 - ▶ What are gaps that you see with what is being offered, versus what you would like to see offered?
 - ▶ Do you anticipate a permanent virtual component as we transition back to in-person classrooms? If yes, what is the virtual component?

Participants described several new resources that have been introduced in classrooms to enhance the experience of virtual learning.

Survey Results



- ▶ What new resources have you introduced into your classroom to enhance the experience of virtual/hybrid learning?
 - ▶ Google Classroom
 - ▶ Sprocket
 - ▶ Nearpod
 - ▶ PhET simulations
 - ▶ Concord Consortium simulations
 - ▶ Comsol
 - ▶ Updated software
 - ▶ Blackboard Collaborate Ultra

Additional resources were also implemented to teach laboratory classes, which have unique challenges when conducted virtually.

Survey Results



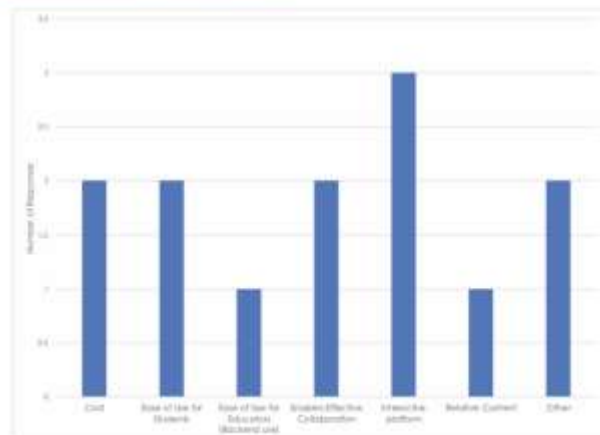
- ▶ If you teach a lab class, what resources are you using?
 - ▶ Whiteboard
 - ▶ Google
 - ▶ Online worksheets
 - ▶ ebooks
 - ▶ Canvas

Interactivity was the priority for K-12 instructors when choosing virtual resources with ease of use and relative content being the lowest priorities.

Survey Results



- ▶ What do you like most about these resources?
 - ▶ Cost
 - ▶ Ease of Use for Students
 - ▶ Ease of Use for Educators (Backend use)
 - ▶ Enables Effective Collaboration
 - ▶ Interactive platform
 - ▶ Relative Content
 - ▶ Other



The gaps in what is being offered versus what instructors would like to see offered is that the content available is different from what they want to teach, and collaboration and flexibility is sometimes missing from third party software.

Survey Results



- ▶ What are gaps that you see with what is being offered, versus what you would like to see offered?
 - ▶ The contents we want is different from they teach
 - ▶ Making it easier for students to be able to used ebooks
 - ▶ Collaboration, flexibility, working with multiple groups simultaneously, and collaborating on third-party software while collaborating online need improvement

