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):

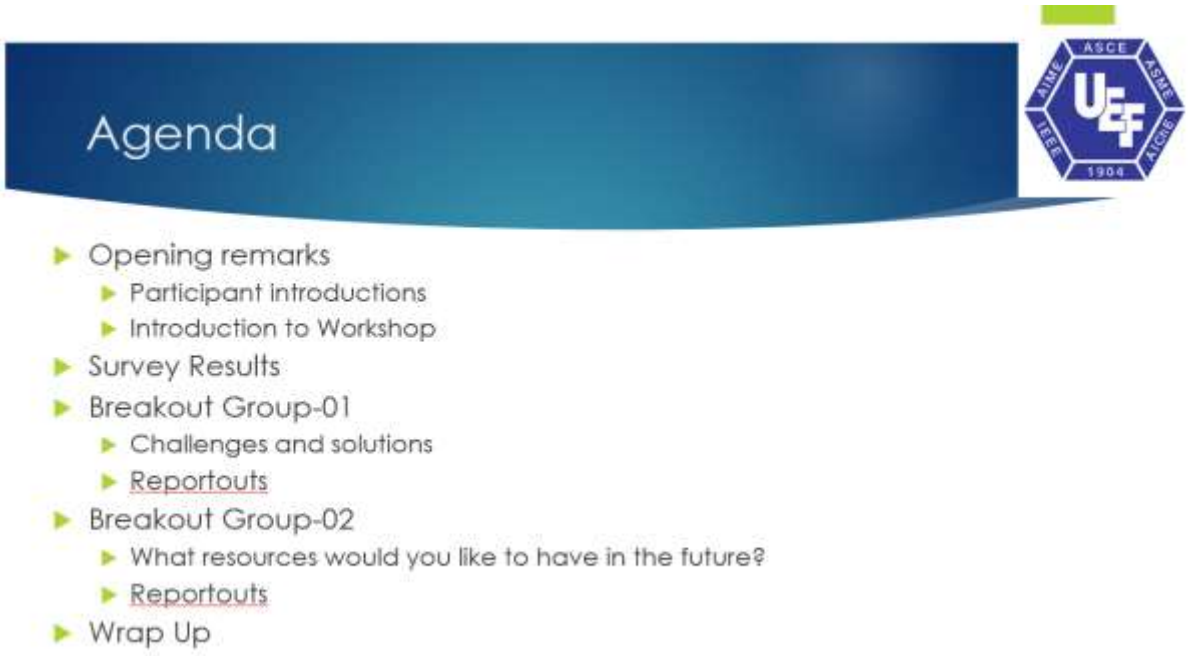
From our discussions, we found that many K-12 instructors did not find the transition to virtual education particularly challenging, as virtual resources have been slowly incorporated into the curriculum in the past few years, therefore easing the transition. However, there were several challenges that 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

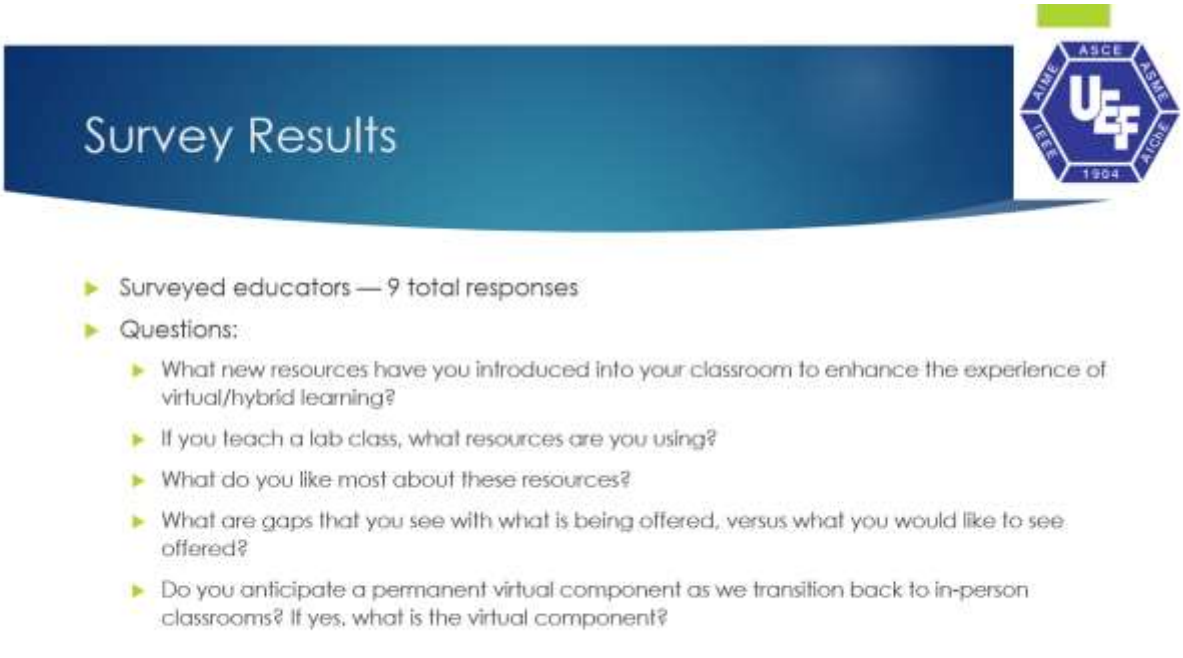
the future, expanding these resources will be necessary to ensure an interactive laboratory experience.

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:



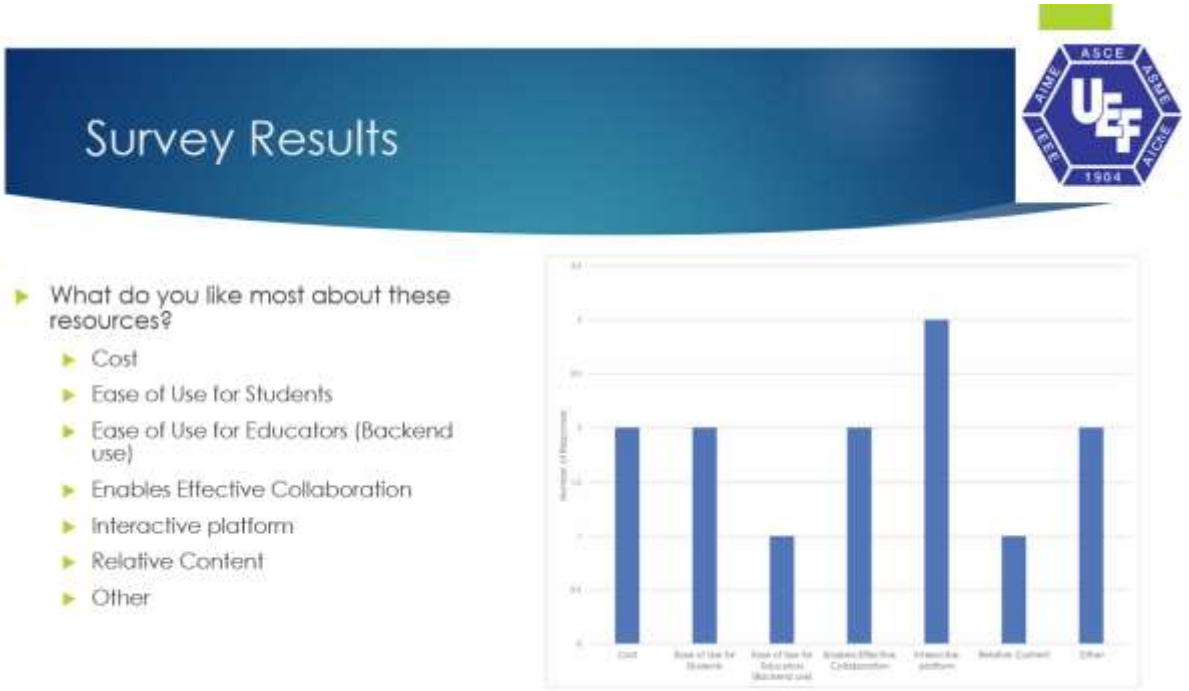
A survey was conducted to outline information about these virtual learning tools for attendees who would like more resources prior to the workshop.



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

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

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



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