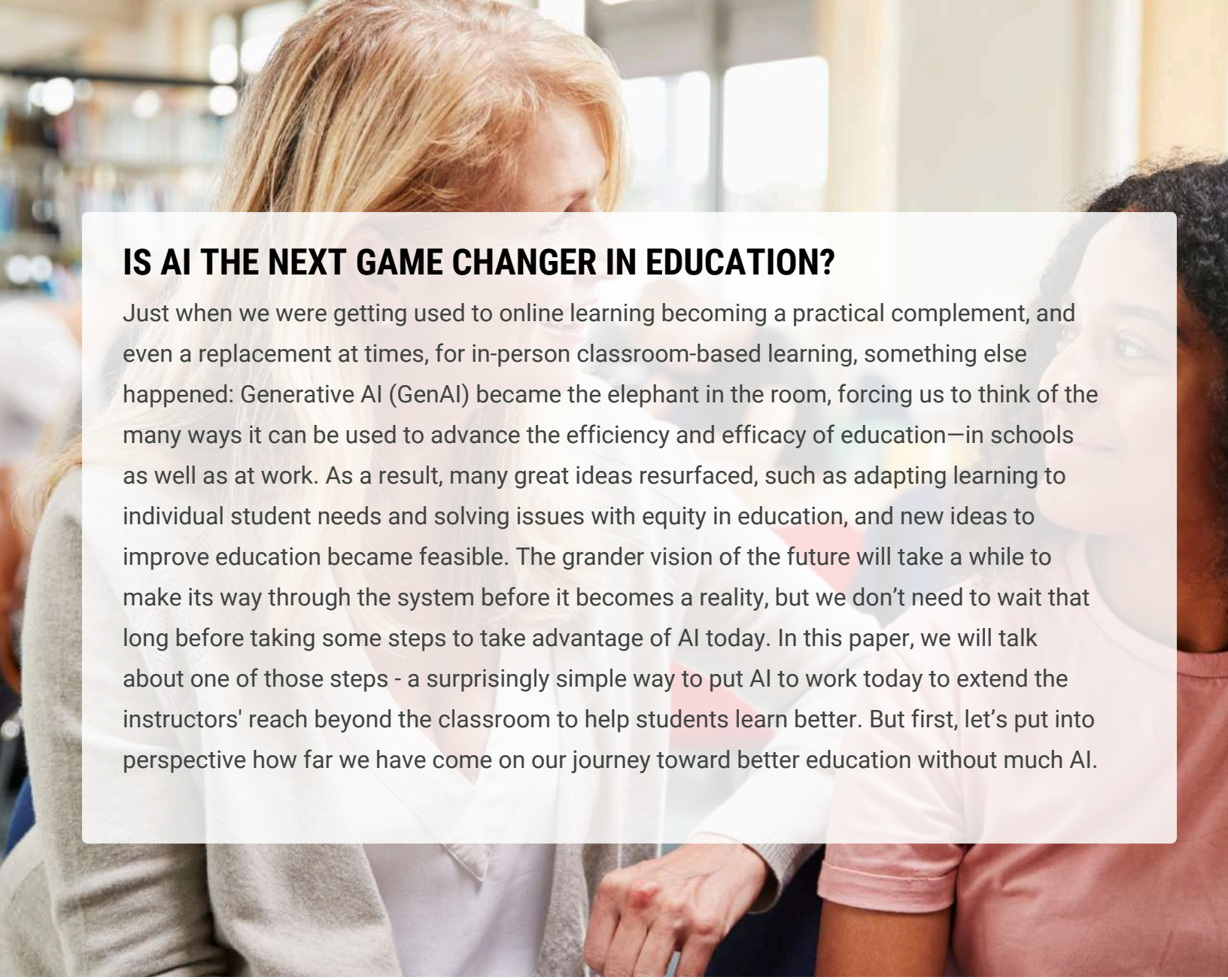
WHERE DOES AI BELONG IN EDUCATION?

White paper

ARMING TEACHERS WITH AI TO HELP STUDENTS LEARN BETTER

HIA STUDIO™

WWW.QVIO.AI



IS AI THE NEXT GAME CHANGER IN EDUCATION?

Just when we were getting used to online learning becoming a practical complement, and even a replacement at times, for in-person classroom-based learning, something else happened: Generative AI (GenAI) became the elephant in the room, forcing us to think of the many ways it can be used to advance the efficiency and efficacy of education—in schools as well as at work. As a result, many great ideas resurfaced, such as adapting learning to individual student needs and solving issues with equity in education, and new ideas to improve education became feasible. The grander vision of the future will take a while to make its way through the system before it becomes a reality, but we don't need to wait that long before taking some steps to take advantage of AI today. In this paper, we will talk about one of those steps - a surprisingly simple way to put AI to work today to extend the instructors' reach beyond the classroom to help students learn better. But first, let's put into perspective how far we have come on our journey toward better education without much AI.

1900-1920
The one-room schoolhouse

1923
Classrooms add radio

1930
Overhead projectors designed for military use spread quickly

1939
LA is the first city to put TV in the classroom

1960
The whiteboard begins to replace the chalkboard

1984
Apple Macintosh Computers introduced, 1:92 student ratio

1994
35% of schools have internet access. 99% will have it by 2002

2012
1.5 Million iPads are used in public schools

2012
MOOCs: Massive Open Online Courses democratize learning

2020
Covid Impact accelerates EdTech adoption

2024
Qvio is launched to extend the reach of educators beyond the classroom

IN-PERSON CLASSROOM EDUCATION

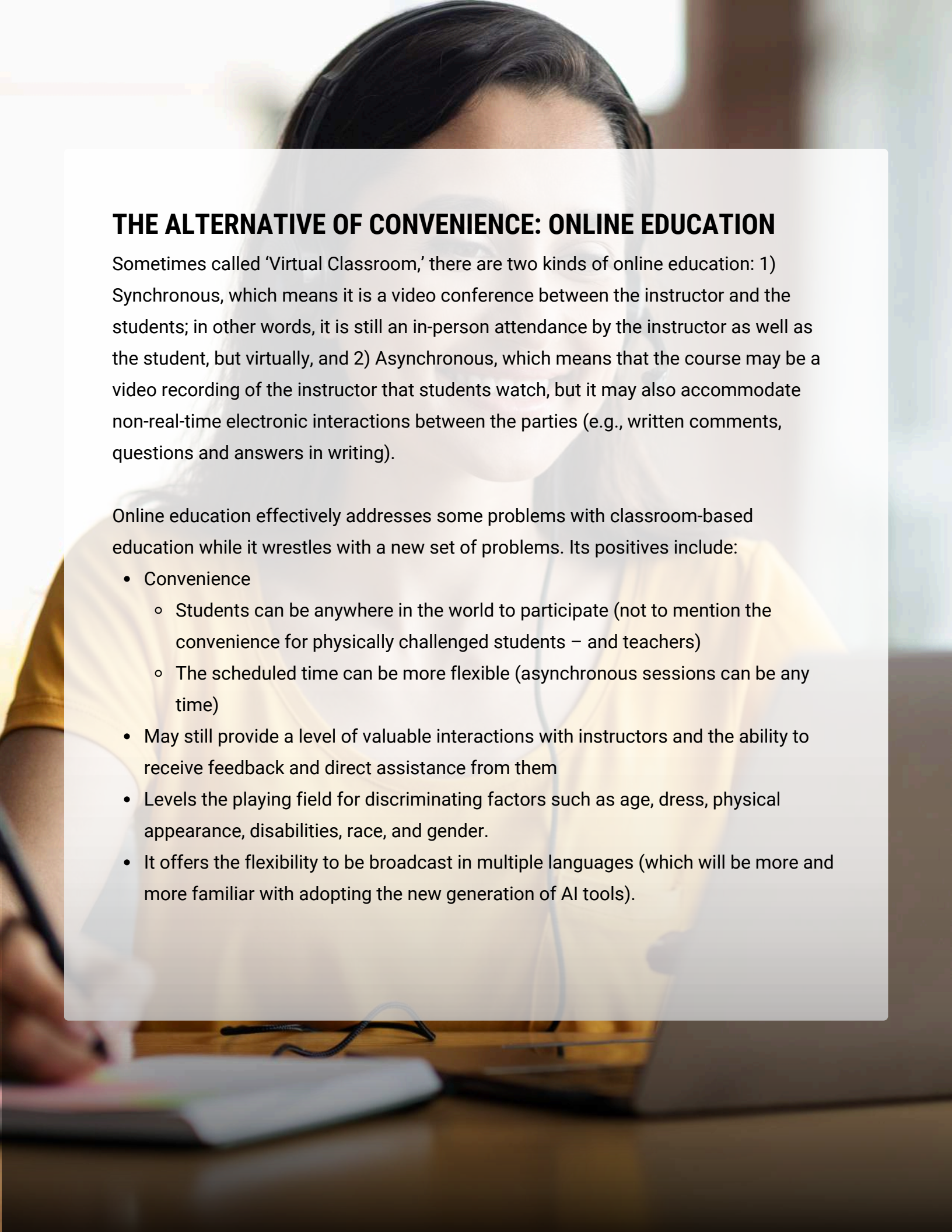
In-person classroom-based learning has been around for centuries. It is still the norm for formal education settings such as schools, universities, and vocational training institutes, but it is also common in professional development and employee training. Much has been said about the importance of in-person classroom-based learning, and it is still all true. It allows learners to:

- Focus on learning without the distractions of home or work; follow a structured schedule (by being at a designated location at a specific time) to keep them organized, focused, and motivated.
- Interact with instructors and ask questions in real-time; receive immediate feedback and direct instructor assistance.
- Participate in group discussions and team projects, providing a more engaging and immersive learning experience and gaining skills directly applicable to real-world situations.
- Interact with their peers; network and build social connections; develop mutually supportive relationships.

ON THE FLIP SIDE...

Classroom-based learning has some built-in barriers to achieving the highest quality of education that is possible (we will put aside, for the time being, the additional offline learning such as homework, which can be the same for the other learning modes):

- The valuable direct learning experience is limited to the allotted time in the classroom – with the allotted time for each student being a small fraction of that.
- The opportunity to ask questions is limited because of
  - The limited time.
  - Difficulty to think of all the questions that one might ask impromptu when class is in progress.
  - Anxiety to ask questions in front of peers; fear of embarrassment.
- It doesn't care if the student is mentally and physically ready to learn at that moment or if the time or place is convenient for the student.
- Social aspects of it may occasionally backfire (discriminating factors such as age, dress, physical appearance, disabilities, race, and gender, not to mention bullying, etc.).
- All interactions are usually in one language.

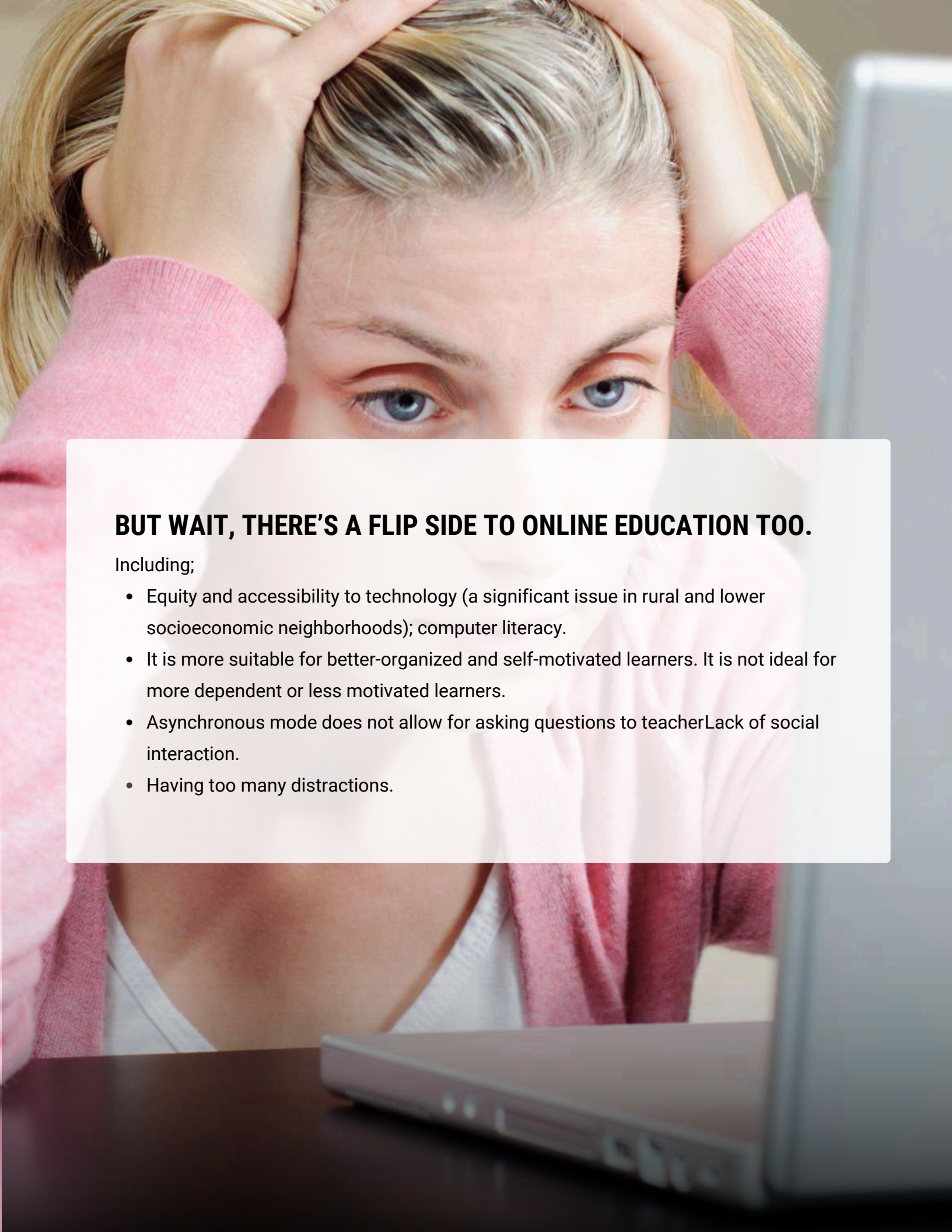


THE ALTERNATIVE OF CONVENIENCE: ONLINE EDUCATION

Sometimes called 'Virtual Classroom,' there are two kinds of online education: 1) Synchronous, which means it is a video conference between the instructor and the students; in other words, it is still an in-person attendance by the instructor as well as the student, but virtually, and 2) Asynchronous, which means that the course may be a video recording of the instructor that students watch, but it may also accommodate non-real-time electronic interactions between the parties (e.g., written comments, questions and answers in writing).

Online education effectively addresses some problems with classroom-based education while it wrestles with a new set of problems. Its positives include:

- Convenience
  - Students can be anywhere in the world to participate (not to mention the convenience for physically challenged students – and teachers)
  - The scheduled time can be more flexible (asynchronous sessions can be any time)
- May still provide a level of valuable interactions with instructors and the ability to receive feedback and direct assistance from them
- Levels the playing field for discriminating factors such as age, dress, physical appearance, disabilities, race, and gender.
- It offers the flexibility to be broadcast in multiple languages (which will be more and more familiar with adopting the new generation of AI tools).



BUT WAIT, THERE'S A FLIP SIDE TO ONLINE EDUCATION TOO.

Including;

- Equity and accessibility to technology (a significant issue in rural and lower socioeconomic neighborhoods); computer literacy.
- It is more suitable for better-organized and self-motivated learners. It is not ideal for more dependent or less motivated learners.
- Asynchronous mode does not allow for asking questions to teacherLack of social interaction.
- Having too many distractions.

HOW CAN AI HELP?

In the relatively short amount of time sophisticated AI tools have been commonly available, there have been numerous areas that are already tagged by educators that can use AI to advance education and make it more equitable, including:

- Personalized and adaptive learning
  - AI can adapt to individual student needs, providing personalized learning experiences. It can tailor content, pacing, and difficulty levels based on each student's progress and learning style. It can also recommend customized learning paths based on student interests, career goals, and learning preferences.
- Automated assessment systems
  - Assessment algorithms can provide course support and management tools to lessen teachers' workloads and extend their capacity and productivity.
- Virtual Teaching Assistants
  - AI-powered chatbots or virtual assistants can answer common student queries, provide explanations, and offer guidance.
- Enhanced Content Creation
  - AI can generate educational content like quizzes, practice exercises, and study materials. It can also create interactive simulations and visualizations.
- Language Translation and Accessibility
  - AI can instantly translate the class materials to other languages and allow student interactions in those languages.
- Emotional Support and Well-Being
  - AI chatbots can provide emotional support, detect signs of distress, and connect students with appropriate resources).

CONTINUED...

Undoubtedly, many other ideas will emerge as winners as we gain more experience with AI in education and learn how to use it safely and reliably. Widespread adoption of AI will have to wait, however, until a large variety of concerns around it are adequately addressed, including:

- Technology issues such as hallucinations and bias
- Ethical concerns in categories such as privacy, bias/discrimination, surveillance, and autonomy
- There are many other practical constraints, such as the additional costs of converting all data into electronic format so it can be managed by AI, the cost of the AI tools themselves, and the not-so-insignificant perception that AI threatens teachers' job security.

Until we go through the complex labyrinth in front of us to arrive at a future where bigger AI dreams are realized, the best question to ask ourselves will be how we can take advantage of AI today that complements — and not replaces — teachers and how it allows teachers to focus their time, skills, and attention on what matters most: helping their students learn better.

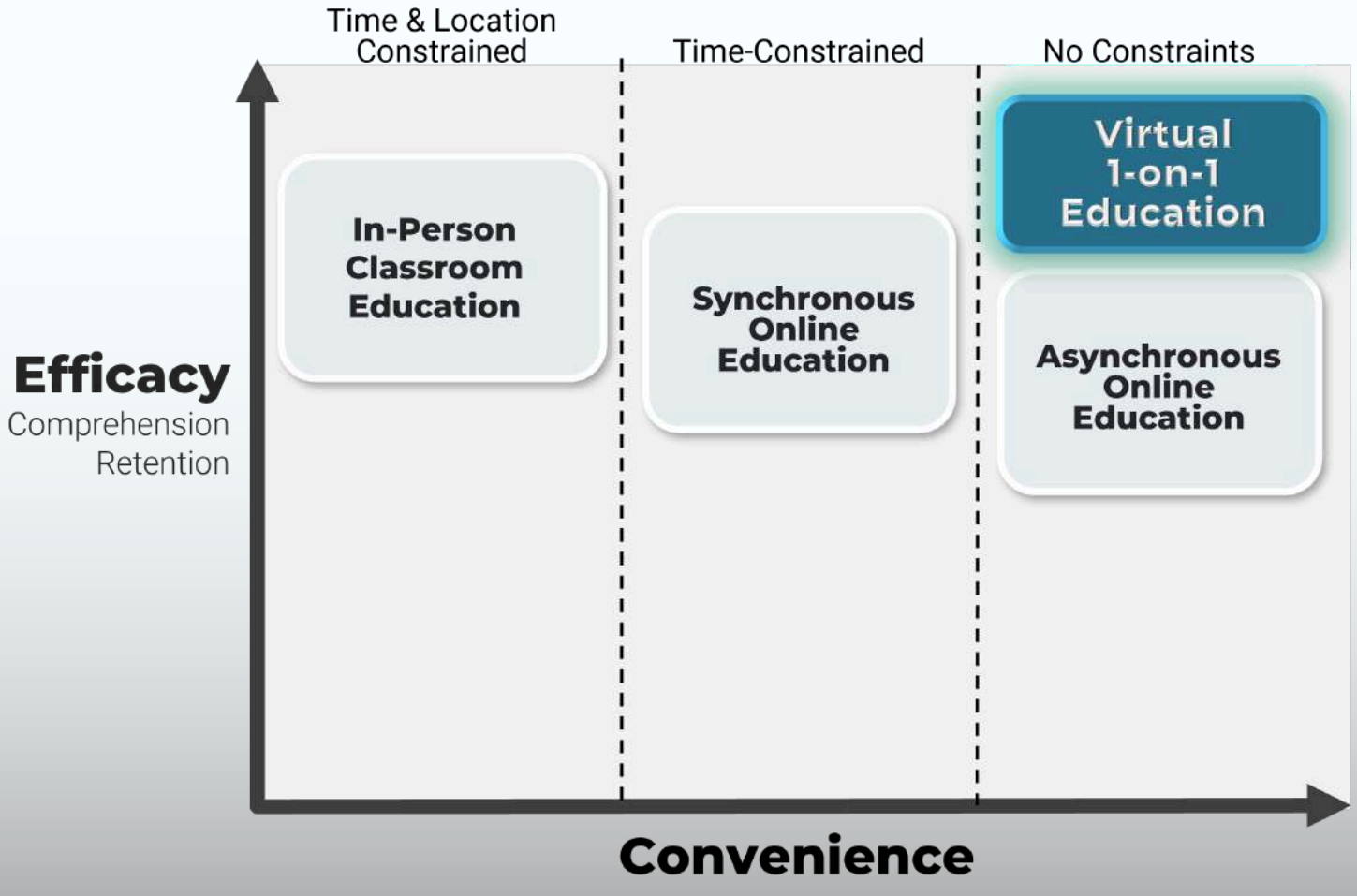
VIRTUAL 1-ON-1 EDUCATION

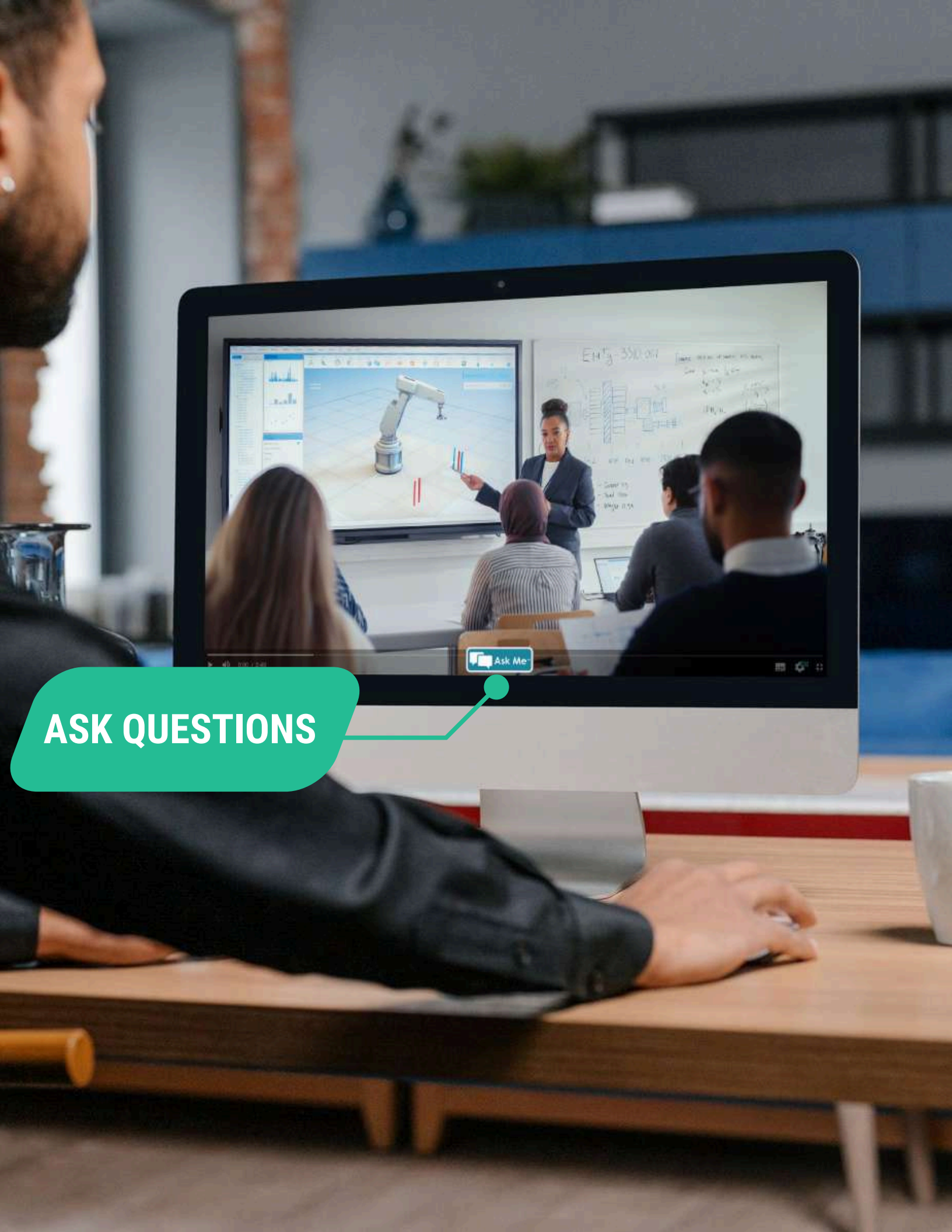
Qvio™ - The new AI-enabled complement to both classroom-based and online education

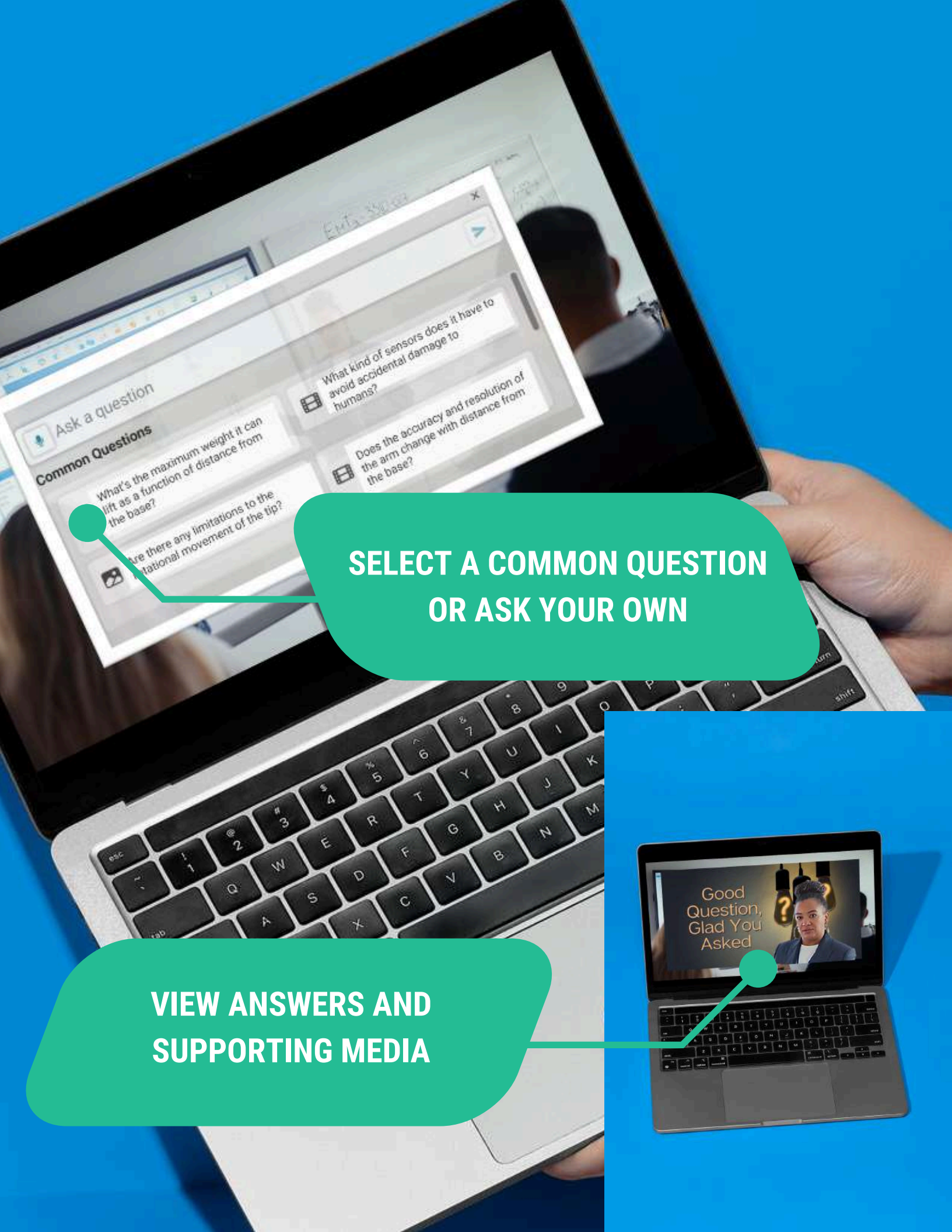
Classroom-based and online education both suffer from the same limitations that can't be easily compensated for. For Classroom learning, you need to be physically at the designated location. For synchronous online education, you must still be 'there' - hooked up to watch and listen online at the specified time. In both cases, learning is limited to the allotted time; instructors cannot allocate each student more than a fraction of the allotted time. The allotted time is never enough for all questions from all students, and even if it were sufficient, students:

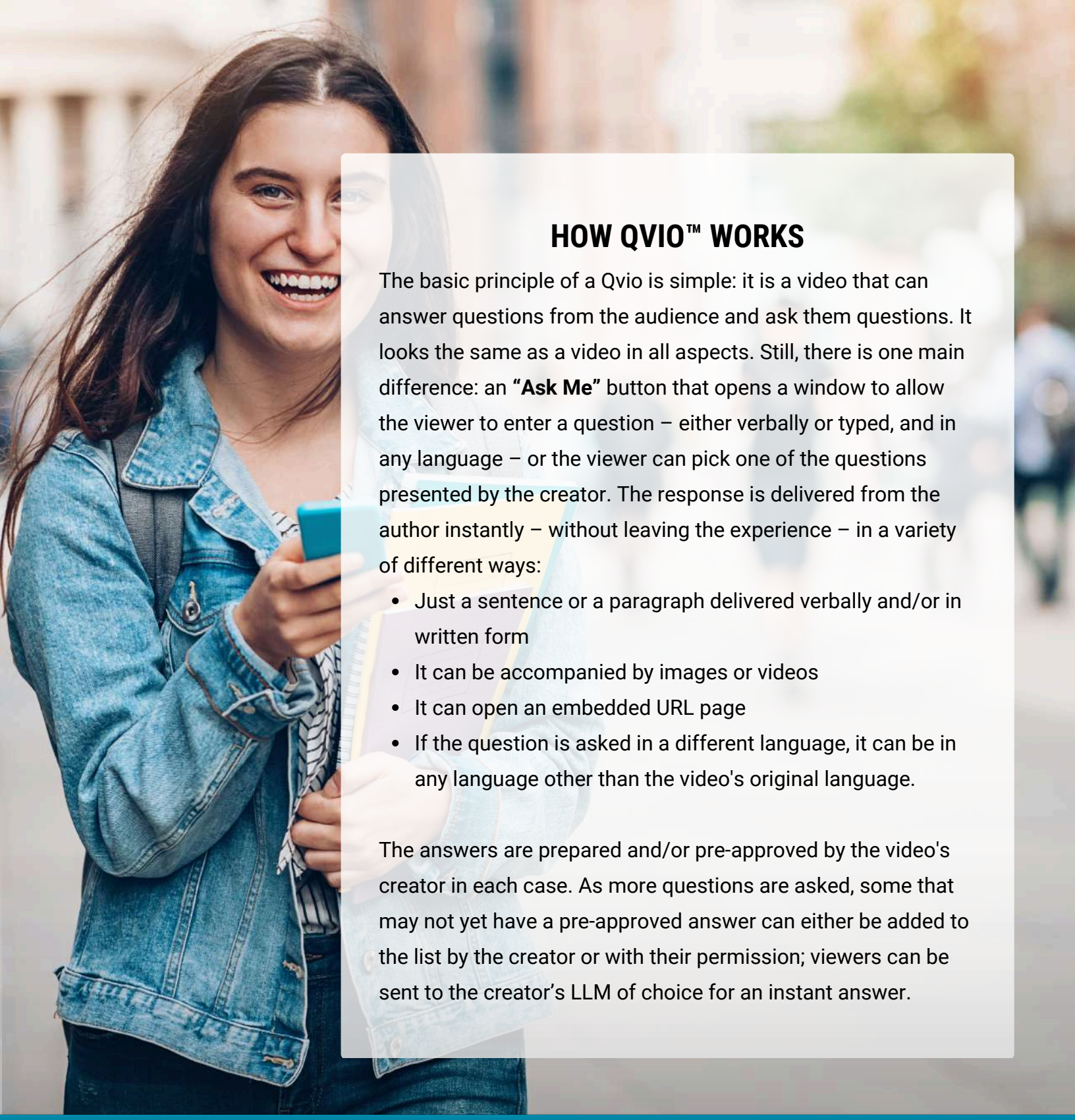
- Cannot always think of all the questions to ask on the spot
- May ask more and deeper, questions when not around their peers

There is a surprisingly simple AI-powered solution that can eliminate all of the above limitations, is easy to implement by instructors, easy to use by students, and allows limitless virtual 1-on-1 teaching sessions between instructors and students 24/7. Students not only watch the instructor presenting the material in exactly the way he/she would want, but they can ask any number of questions (in any language) to the instructor, and they would get answers back in precisely the way the instructor would have answered word for word (in any language). This is the promise of the Qvio™.




Ask Me
ASK QUESTIONS


Ask a question
Common Questions
What's the maximum weight it can lift as a function of distance from the base?
What kind of sensors does it have to avoid accidental damage to humans?
Does the accuracy and resolution of the arm change with distance from the base?
SELECT A COMMON QUESTION OR ASK YOUR OWN
Good Question, Glad You Asked
VIEW ANSWERS AND SUPPORTING MEDIA



HOW QVIO™ WORKS

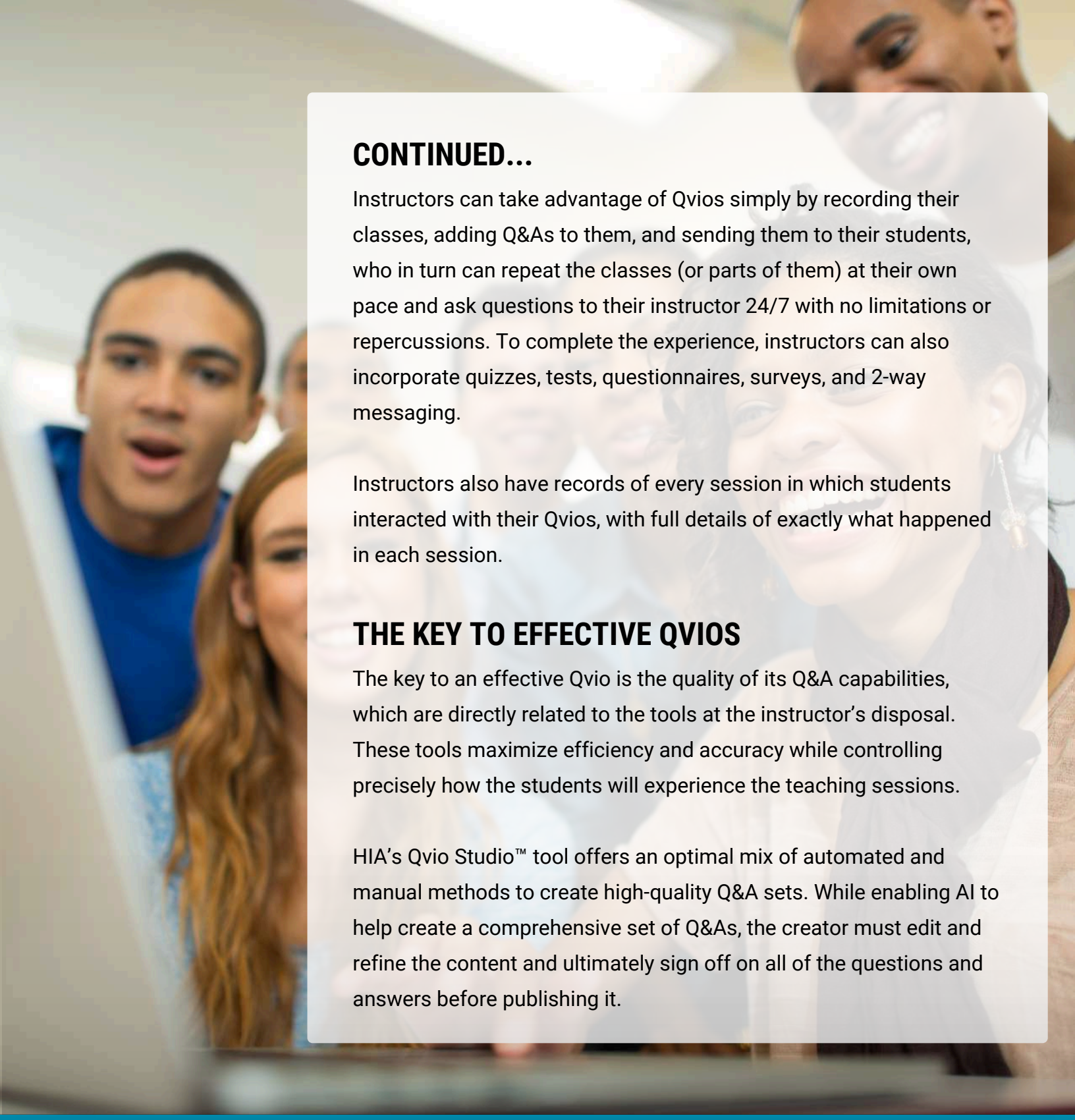
The basic principle of a Qvio is simple: it is a video that can answer questions from the audience and ask them questions. It looks the same as a video in all aspects. Still, there is one main difference: an **“Ask Me”** button that opens a window to allow the viewer to enter a question – either verbally or typed, and in any language – or the viewer can pick one of the questions presented by the creator. The response is delivered from the author instantly – without leaving the experience – in a variety of different ways:

- Just a sentence or a paragraph delivered verbally and/or in written form
- It can be accompanied by images or videos
- It can open an embedded URL page
- If the question is asked in a different language, it can be in any language other than the video's original language.

The answers are prepared and/or pre-approved by the video's creator in each case. As more questions are asked, some that may not yet have a pre-approved answer can either be added to the list by the creator or with their permission; viewers can be sent to the creator’s LLM of choice for an instant answer.

ASK ME

Every Qvio includes the “Ask Me” button /call-to-action challenging learners to abandon view-only video and engage with Qvio.



CONTINUED...

Instructors can take advantage of Qvios simply by recording their classes, adding Q&As to them, and sending them to their students, who in turn can repeat the classes (or parts of them) at their own pace and ask questions to their instructor 24/7 with no limitations or repercussions. To complete the experience, instructors can also incorporate quizzes, tests, questionnaires, surveys, and 2-way messaging.

Instructors also have records of every session in which students interacted with their Qvios, with full details of exactly what happened in each session.

THE KEY TO EFFECTIVE QVIOS

The key to an effective Qvio is the quality of its Q&A capabilities, which are directly related to the tools at the instructor's disposal. These tools maximize efficiency and accuracy while controlling precisely how the students will experience the teaching sessions.

HIA's Qvio Studio™ tool offers an optimal mix of automated and manual methods to create high-quality Q&A sets. While enabling AI to help create a comprehensive set of Q&As, the creator must edit and refine the content and ultimately sign off on all of the questions and answers before publishing it.

PREAPARING BASE Q&A PAIRS FOR YOUR AUTHOR-CONTROLLED AI™ - AS EASY AS ONE-TWO-THREE

1

Generate Q&A from your video script or connected LLM

2

Add any additional pairs you want to address

3

Support answers with media. Images, videos, links, etc.

PREPARING THE QUESTIONS AND ANSWERS

The initial Q&A set can be generated in several ways. At the one extreme, everything can be entered manually one by one, and at the other extreme, all Q&As can be generated in a fully automated manner. Between those extremes, you have a combination of both, likely to provide the best results. Within Qvio instructors have these options to develop the base Q&A pairs that ultimately serve as the foundational knowledge for the Controlled AI.

GENERATE FROM TRANSCRIPT

Use GenAI tools to generate Q&A pairs from your video transcript

GENERATE FROM FILE

Use GenAI tools to generate Q&A pairs from other sources (book chapters, published papers, etc.)

IMPORT PAIRS FROM FILE

Import Q&A pairs from a prepared file - good for anticipated questions

ADD Q&A PAIRS AS NEEDED

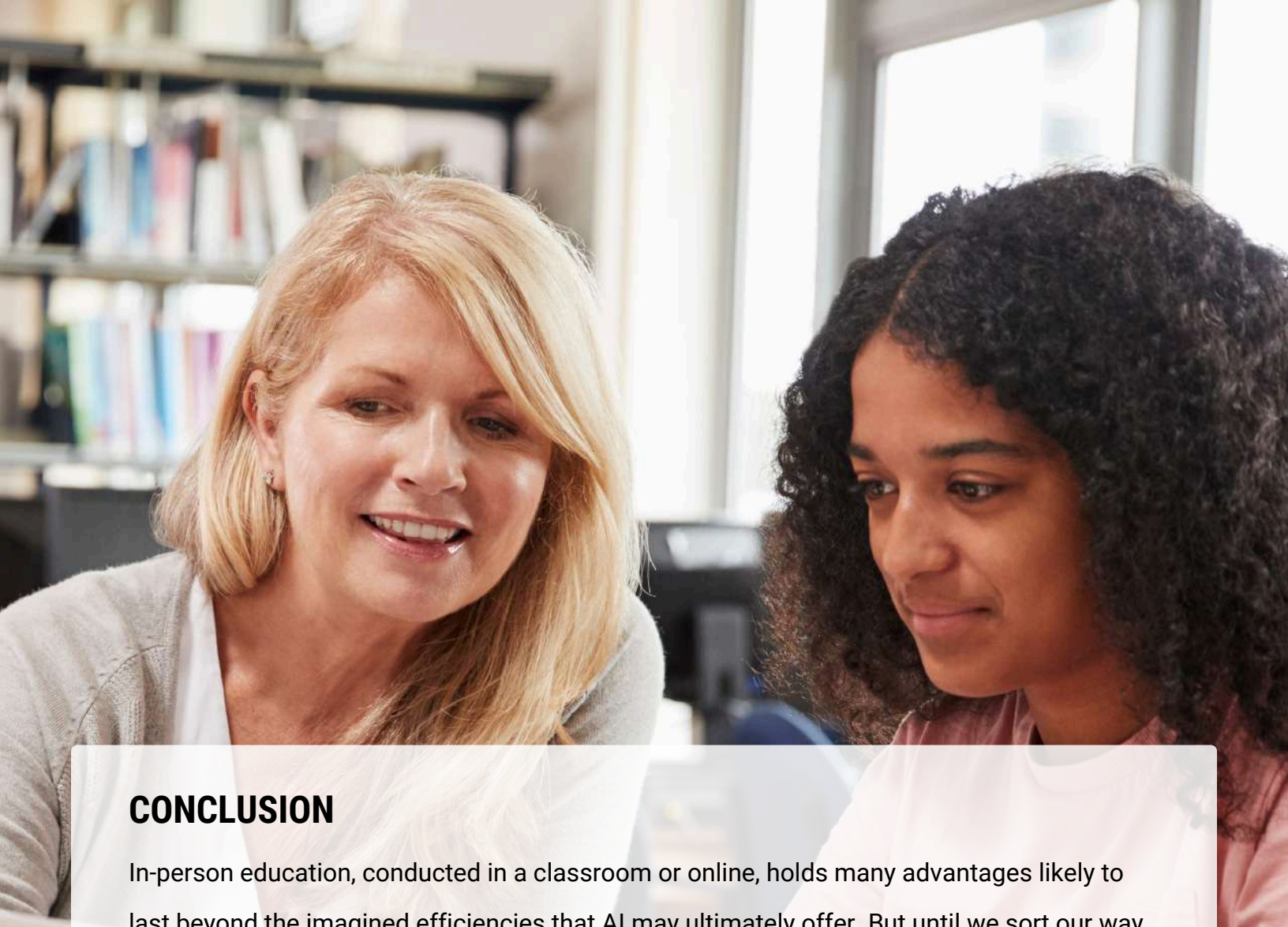
Add additional pairs as needed to support the learner experience

Once your video is uploaded, and Q&A is added - you simply add any additional supporting media to enhance your answers, and publish the new interactive video. Qvios can be shared in many of the same ways video is shared today.

WHEN A QUESTION IS ASKED...

When students ask questions to the Qvio, the built-in Controlled-AI in the product matches those questions to the list of the approved Q&A, and if there is a strong match (i.e. if confidence thresholds are met), the answers are delivered as programmed. If a question is asked that cannot be answered both the student and instructor are notified. The system cannot go rogue and create answers on its own - a safety net for everyone involved. However, if a trusted LLM exists outside Qvio, it can be connected to it to increase the probability of answering all possible questions. Instructors receive an AIM™ (Automated Intelligence Modification) notification of the unanswered question and can immediately incorporate it or take action on it from the notification. This feedback loop results in iterative improvement and a richer experience as the content is used.

The AIM™ feedback loop allows content to be improved over time and to grow and evolve as information changes, rather than locking learners in to outdated information.



CONCLUSION

In-person education, conducted in a classroom or online, holds many advantages likely to last beyond the imagined efficiencies that AI may ultimately offer. But until we sort our way through the complex labyrinth ahead of us to achieve those efficiencies safely and reliably, there is no delay in leveraging some of the simple ways AI can improve the efficacy and efficiency of teaching.

A prime example is the Qvio, which complements rather than replaces teachers. It enhances what teachers excel at, allowing them to concentrate their time, skills, and attention on what's most important: helping students learn more effectively. With Qvios, their students can repeat their classes 24/7 without limits and can now act as 1-on-1 teaching experiences entirely under their control. Qvios are the perfect supplement to traditional in-person education.

Qvio™

View. Ask. Learn.

READY TO GET STARTED?

Visit www.Qvio.AI to sign up today

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