**Sal Khan:** 0:00

It's interesting, especially in poorer parts of the world, including in poorer parts of the United States, people are skeptical of things that are free. That's right. They think there must be a catch and that's the irony here. Because affluent families have a high usage of Khan Academy. They know that it's better than what they could pay for. And then you have poor families that don't fully appreciate that. So we need to and obviously we're working with anyone who we can to build that awareness. Khan Academy already exists in 50 plus languages to different degrees of fidelity. For example, in Spanish or Brazilian, Portuguese or Hindi. It's almost as good as it is in English, and generative AI has an interesting dimension to this.

**Craig Smith:** 0:39

AI might be the most important new computer technology ever. It's storming every industry and literally billions of dollars are being invested, so buckle up. The problem is that AI needs a lot of speed and processing power. So how do you compete without cost spiraling out of control? It's time to upgrade to the next generation of the cloud Oracle Cloud Infrastructure, or OCI. Oci is a single platform for your infrastructure, database, application development and AI needs. Oci has four to eight times the bandwidth of other clouds, offers one consistent price instead of variable regional pricing and, of course, nobody does data better than Oracle. So now you can train your AI models at twice the speed and less than half the cost of other clouds. If you want to do more and spend less, like Uber 8x8, and Databricks Mosaic, take a free test drive of OCI at oracle com slash ion AI. That's oracle.com slash ion AI. Hi, I'm Craig Smith and this is my AI. In this episode, I talked to Sal Khan, founder and CEO of Khan Academy. We talk about how artificial intelligence and generative AI can transform education. Sal discusses Khan Academy's new AI powered tutoring tool called Khan Amigo, powered by GPT-4, which provides personalized instruction and assistance to students. We talked about the challenges and opportunities of implementing AI and education, including issues around bias, transparency and cheating. Sal shared his vision for using AI to provide high quality, personalized education to all students globally and how it can supplement teachers instead of replacing them. I hope you find the conversation as fascinating as I did. I'm Sal.

**Sal Khan:** 3:02

Khan. I'm the founder and CEO of Khan Academy. We're not for profit, with a mission of providing a free, world-class education for anyone, anywhere.

**Craig Smith:** 3:12

Where did you go to school and how did you start Khan Academy?

**Sal Khan:** 3:16

It depends how far you want to go back. I went to school. I was born and raised in the New Orleans area. I eventually ended up doing my undergrad at MIT. I think that's a little bit connected to. I initially thought I wanted to be an AI researcher back in the day, but I kept falling into this education. I kept gravitating towards education. I ended up going and working in tech, not in education. And then I go to business school, at Harvard Business School and then I found myself as an analyst at a hedge fund and I always used to tell folks when I was at the hedge fund hey, I'm just going to do this long enough so that one day I could start a school on my own terms and be like the Dumbledore figure. And it was around that time, 2004,. I was a year out of business school. I had just gotten married, I had family visiting me from New Orleans and it just came out in a conversation that my 12-year-old cousin, nadia, was having trouble with math. I offered to tutor her remotely. She agreed. Long story short, it helped. She got caught up with her class, even a little ahead of her class. At that point I became what I call a tiger cousin. I called her school. I said I really think Nadia Ramon should be able to retake that placement exam from last year. They said who are you? I said I'm her cousin and they led her. And the same Nadia who was put in a remedial track was then put into an advanced track. I started tutoring her younger brothers. Word spreads in my family. Free tutoring is going on. Before I knew it I'm tutoring 10, 15 cousins and I had a day job. I was an analyst at a hedge fund and then it was around 2005 that my background was in software. I see some common patterns with my cousins. They need more practice. They had some gaps in their learning that were keeping them from advancing. So I started writing software for them that would let them practice at their own pace, like me as their teacher or their tutor keep track of what they were doing. And I called it Khan Academy. The domain name was available and it was kind of my family project and I did have, even then, slightly delusional aspirations that one day it could turn into a real institution that could educate a lot of folks. In 2006, a friend suggested I make videos to supplement that software. I initially thought it was a bad idea. I said that's frivolous YouTube, you can't do anything serious on that. And I gave it a shot and that took on a life of its own. And then, by 2009, I frankly had trouble focusing on my day job and we set up. I set up Khan Academy as a not-for-profit mission free world class education for anyone anywhere. Quit my day job. It was a stressful year but by 2010, we had our first philanthropic support to become a real organization.

**Craig Smith:** 5:48

Yeah, and you have a bricks and mortar school somewhere, don't you?

**Sal Khan:** 5:52

Yeah, so this is a sister side project to the core of Khan Academy. I wrote a book in 2012 called the One World Schoolhouse. The first third of the book is how did the education system just get to the way it is today? The middle third of the book was what I just outlined how I fell into this Khan Academy journey. And the last third of the book was well, given the tools we now have and what the world likely needs, what would education look like if you think about it from first? Principles and ideas of personalization. You don't have to have every student work in lockstep. If you need more time to learn something, great, if you've already learned it, move on. Related to this idea is this notion of, instead of seat time hey, I need you to sit in a chair and learn a year of algebra, two years of algebra. What matters is whether you know it or not. It might take you two weeks. It might take you two years. So, whether you want to call that competency-based versus seat time or mastery learning, mastery learning is a related idea that, if you haven't learned it well yet, keep working on it. You should have that opportunity. And there were other ideas about how you can use tools so you can free up more time for human interaction, et cetera, et cetera. One thing to write about all this whole. Other things to implement. Also, I had a selfish motivation in 2014, my oldest child, who's now 14, but he was entering kindergarten and I was already doing the rounds telling everyone about personalization and mastery and how all of these tools could be used, and I didn't want to be a hypocrite. I'm saying all this stuff, but my own kids aren't experiencing it. And so we started ConLabs School. It's a different organization than Con Academy, but I obviously helped start it and I'm the chair of that school. But the whole idea is that Con Academy is already reaching hundreds of millions and, one-day billions of folks, and that's great. Absolutely, we can have a lot of positive impact through that. But it would be a shame if, even though that exists, that we haven't been able to reimagine what schools could look like, and so the hope is ConLabs School. It is a K-12 school out here in Silicon Valley. It's only 300 students, but if we can be very transparent and show ways to do it that aren't ridiculously resource intensive, that can make a more enriching experience for everyone, so be it. We also have another project. This is a newer ConWorld School. We started with Arizona State University. We're like can we scale this idea even further? We have an online high school and now middle school that can embody some of these same principles.

**Craig Smith:** 8:18

Yeah, how much AI. Well, first of all, what did you study as an undergraduate at MIT? And then I wanted to ask how much AI is in the platform at this point.

**Sal Khan:** 8:31

I majored in computer science. I'm majoring in computer science and math. Some of my freshman advisors were Henry Patrick Winston, who was one of the fathers of AI. I took the Marvin Minsky course, who was obviously one of the titans of AI back in the day. In terms of Khan Academy, until this last year, we had dabbled a bit in AI to do things like recommendations for the next best activity, et cetera. When OpenAI reached out to us a little over a year ago this was summer of 2022, and showed us GPT-4. And we were seeing it before anyone else saw this, and this was months before chat GPT came out. Chat GPT is not even using GPT-4. It's really just a chat interface on GPT-3, gpt-3.5. But that was the first time we said wow. A lot of ways, everything that Khan Academy is about is scaling what I was originally doing for my cousins, and this technology bears promise to take it that much further, go that much richer. So we signed the nondisclosure agreement with OpenAI and we went heads down to say, all right, is there a way to do this so we can capture the upsides a tutor for every student, a teaching assistant for every teacher and also mitigate the downsides the cheating risk, the bias, the transparency, hallucinations a lot of these models out the box aren't that good at math. How do we address that? And that's what we've been working on and we launched in March of 2023, at the same day that GPT-4 was launched, and it's called Kanmigo, and I think when people use it on Khan Academy, they see that it's dramatically different than what a lot of folks even come to expect from GPT-4. It really has a Socratic tutor element to it. It is surprisingly better at math than a lot of people expect. We've done a lot of work on that. We've done a lot of work to minimize hallucinations and we have a whole series of guardrails to help protect young people, young learners.

**Craig Smith:** 10:24

Yeah, and how do you guard against hallucinations, which, for me, is the real challenge of using LLMs for education? Do you tie it to a vector database, which seems to be the most popular solution?

**Sal Khan:** 10:43

We do all of the above. We definitely have a vector database For those who are. That's this whole idea that you can put documents into a form that when the AI is having a conversation with you, it can say what are documents that are very close in the vector space to this conversation and then slurp those out, summarize them and then use those as your fact base. So we're doing that. We put very simple guardrails. We use a vector database. Actually for KUN, we go to provide internal links within KUN. Academy Links are one of those places where if you let it make up the links, it'll make up links, so it doesn't provide links outside. It's also in the prompting. It anchors usually on KUN Academy content, either article, video or exercise. So that also helps minimize things like hallucinations. And then at this stage I think in the next year or two you're going to see the underlying models get a lot better at both the hallucinations and providing references. But I also think there's just a digital literacy aspect to it, making folks know that, look, if there's something that is being said that you're going to index very heavily on, you have to double check it. And honestly, that's true even before generative AI. That's true even if a teacher tells you something in a classroom where you read something on the internet.

**Craig Smith:** 11:54

Yeah, as I said, particularly interested in AI tutors. So is Kanamego essentially an AI tutor. I haven't used it. I've talked to people that have, and let me explain what I mean by AI tutor and you can tell me whether you guys are doing this. So there's this company I'm familiar with, I've written about in Korea. There's also Yahshua Benches. One of his students has a company called Corbett. I don't know if you're familiar with K-O-R-B-I-T out of Montreal. It's an AI tutor, and both of these guys, these companies say they have a knowledge tracing algorithm that tracks the student knowledge as the student interacts with the system. They have the recommendation engine that then recommends content of video or text or audio To the student to fill in gaps in the student's knowledge. And then they which I thought was brilliant the Korean group has a score prediction algorithms and so if you're working on they focus on test prep, but it would work equally in coursework. It predicts your final score and if you follow the recommendations that the system is giving you based on the knowledge tracing algorithms, your predicted score goes up until at the end they meet. So you get the score that it says you're going to get and it's an incentive to follow the recommendations. That to me sounded like a game changer, but I don't see it anywhere in the market. I mean, these guys are having other than test prep, they're having difficulty getting into schools and that sort of thing. I guess one does that kind of a system make sense. Is Khan Academy building something similar? And two, why is there such resistance to these solutions which really do promise personalized education for anyone with an internet connection?

**Sal Khan:** 14:27

Yeah, what you just described, where a system is intelligently recommending the next best thing for a student to work on, based on past performance, and is even able to do some inference and prediction and even tell, say, the student or teachers or parents hey, and this is a way that you can help also support what's the next best for the student. In many ways, that is what Khan Academy 1.0 is. That's kind of what we've been working on for over a decade now. I think what we are now talking about is taking it a step further, which is feeding all of that into the next generation, a generative AI model with a lot happening at the application layer, where it can converse with you, where it really feels like you're, and it can dive in deeper. If you're watching a video, just as if you'd ask a teacher a question, you can ask it a question. If you say, why do I need to learn this? And it'll say, well, what do you care about? And you say, well, I care about this, and it remembers it. So it's starting to get into almost more of the EQ side of what a great tutor would be. Yes, it can help you on block, it can recommend, but it can also emote and I know that's a strange thing to say but it can also empathize. It can, it'll remember interactions, it can have a long-form relationship with the user and also it's connected to the teacher and there it acts as something of a teaching assistant where it can report back to the teacher or the parent or both. What the students have been up to, what would have been up to collaborating with the teacher to modify lesson plans, create, even potentially help creating things like that, so that the teacher feels even sorry, the student feels even more supported. I actually have never sensed resistance to these types of things. I think it's more about traditional ed tech and I put Khan Academy in this category if you make a tool and you go to a teacher and we've had hundreds of thousands of teachers use it in classrooms. But if you go to a new teacher who is doing their thing and you say look, we have the efficacy studies, the students do this, they're accelerating by whatever 30, 40% and here's all your tools. Most teachers, when they see that, if they think you're being genuine and the efficacy studies look legit, they're like oh, this is great, I definitely want to do this, I care about, I want to accelerate, but they're already overworked. They already have a million things to do, and now you're expecting them to learn one more tool and figure out how to and space in the classroom and all of that, and so I think that's historically been the hard part. What's interesting about this next wave, especially with generative AI? Teachers spend 10, 15 hours a week doing things like lesson planning, grading papers, writing progress reports just helping them. Having the generative AI helps them with that. I think we can get that 15 hours down to one hour, two hours. So it's going to be natural. It's going to create less time and energy scarcity for the teacher, which is a natural incentive for them to do it. And then, obviously, if it can help the student to, and they can more personalize their questions and there's healthy reporting and safeguards going back and forth. Right, you know we just started talking about this only a few months ago, and when I tell our team like hey, why aren't we having more school districts using it? They're like it's us, like we're pushing people away. Right now, people are actually very eager to use Conmigo.

**Craig Smith:** 17:43

Yeah, and, and the thing I've heard and I've spoken to teachers. I've written sporadically about this since, I think, 2019, my first article. I did an article for the Times the. The teachers are eager and I've spoken to teachers that use Khan Academy because they can use it for free. And this leads to a question about the business model. But if you want a school system, a district, to adopt it, you know it gets tied up in, you know budgeting and teachers, unions and all these different things that make it very complicated. So Khan Academy has been successful in penetrating that market because it's free and the teachers can grab it directly. But what's the business model? I mean, how, how can you keep developing and keep it affordable?

**Sal Khan:** 18:48

Yeah, and it's, it's, it's well, it's getting more and more nuanced. I think historically you're absolutely right. Our mission is free world class education for anyone anywhere. It's not free to produce at Khan Academy, so we've had to raise it. Our budget now is pushing $70 million a year. That's a lot of money. It gives me some anxiety having to, you know, work with the team to raise that Every year. But I remind folks, that's the budget of a large high school in the United States and we're reaching a fraction of humanity and hopefully a large fraction eventually. But there's a few things we've realized over the last few years. If you rewind about six years ago, we had this, all these efficacy studies about how Khan Academy can help If students put even 30 to 60 minutes a week in. We had a lot of teachers. We call them grassroots teachers who are just using it on their own, hundreds of thousands. And then we would ask ourselves well, why aren't districts using us systematically? Why don't they use us as a core resource in what they do? And so we started talking to leadership at school districts and almost every conversation would start off with one of them saying oh, first of all, thank you, my niece or nephew or my son or daughter or even myself, going through graduate school. Khan Academy really helped in some way, shape or form. And they would then say, oh, and we believe your efficacy studies I mean, my niece swears by it, et cetera. But if you want us to use it systematically, you have to give us support, training, integration with our rostering systems, and district level dashboards. And that was the first time in Khan Academy's journey this was five, six years ago where we said, wow, that's a lot of boots on the ground, so to speak. That's a lot of enterprise level. But if we're really serious about moving the dial, especially for the kids who need it the most, we should do those things. But at the same time, those things are also very expensive on an incremental basis to send someone there to do the training and look at the IT systems. So we told the school districts we're like look, our whole goal is to just improve education generally. Support you, but we're gonna have to charge you for that. So we created what we call our district offering. It's $10 per student per year for all of that bespoke support and dashboards for the district to use it. Well, you fast forward to this past year and we launched ConMigo. Conmigo adds another element to it, which is the computation costs of especially frontier models like GPT-4, generative AI. It's very expensive. Initially our estimates were looking something like $10 or $15 per user per month just for the computation. There's a reason why chat GPT-PRO is $20. The one that uses GPT-4 is $20 a month. And so, coming out of the gate, we just were very ultra transparent with school districts. We're like we're building this thing, we believe the cost is going to come down, but if you wanna use this right now, we just wanna cover the checks that we have to write to open AI, which is writing them to Microsoft, which is essentially writing them to Nvidia, and so we already have about 50,000 users in districts not 50,000 districts 50,000 students and teachers already this school year using ConMigo in that district setting where the district is resourcing it in this way, and there's even a state of Indiana is actually doing a pretty big project with a bunch of folks using ConMigo and Con for districts. The good news is we think we're gonna be able to bring that down dramatically, I think by the end of this year. The computation costs are going to be on the order of $10 or $15 per year. We've been doing a lot of efficiencies on our end on how we use that computation, and then there is a pretty heavy support and training, especially with generative AI. You wanna almost have a white glove service for the teachers and for the administrators. So that's probably also just the cost of that, is probably another let's call it $10 per user per year type of thing. I mean, it's mostly focused on the teachers and the administrators, though, and but you know, I think it's gonna get us to a place where, in places like the United States, this will be, I think, much more affordable in the $20 to $30 per year range, maybe a little bit more. And there's something also interesting where, if you go into the developing world, especially the developing world that's on the other side of the planet, and we have a dedicated instance of GPT-4, it's not being utilized that much at three in the morning, California time. That could be really interesting to utilize that and offer it at a much, much more accessible rate. As I was saying, we're a nonprofit and our mission says free. We're just trying to make it as accessible as possible. So, you know, think about what we could do in India or the Philippines or places like that which we're already thinking about.

**Craig Smith:** 23:32

Yeah on where it's going and I'm sorry I didn't play around with kind of me before the call, but I will. So I think this system that I described and then that kind of me go is building toward. Recently, again, with generative AI, real-time avatars have made a huge leap and I always thought that that was the missing piece in AI tutors, because it's one thing, for and I visited schools that are using different kinds of technology and you have these kids like slumped in their chair and they're tapping on the keyboard and looking at their phone and paying attention to their friends but if you had a face of someone that's reacting to you and talking to you, as opposed to just lines of text streaming across the screen, I think it would be a lot more engaging. Have you thought about that?

**Sal Khan:** 24:43

Yes, and I have no doubt that that's going to come. I don't think it's going to come immediately. I think we're probably looking at probably the three-year timeframe for that to become really well done, well implemented, and I think it's. I don't think that's actually a substitute. I think that's just going to be part of the mix, Right, right. As we know, kids even with real human beings sometimes chat is their optimal mode. There's sometimes it feels like a lower threshold, easier to ask questions, but we're already working on being able to have voice conversations and, yes, I think it's in the not too far future, you're going to be able to have a video conference with your AI tutor and see its emotions, and it will be able to see your emotions too, which will be pretty powerful.

**Craig Smith:** 25:22

Yeah, so the adding generative AI capabilities is kind of where you are and in Conomego is the focus right now, or where is the company building?

**Sal Khan:** 25:43

Yeah, it's all of the above. You know our core, you know our vision of free, world-class education for anyone, anywhere. We've always said that means we want to have all the core academic material, from pre-K through the core of college, available in all of the world's major languages to be usable in a self-paced mastery way exercises, videos, articles, teacher tools and now generative AI, tutors and teaching assistants. So we're continuing to develop our core content, we are continuing to build out teacher and district tools but, yes, generative AI is definitely an ever-increasing area of focus for us.

**Craig Smith:** 26:20

Yeah. Do you partner with different schools or with different sorts of MOOCs, like platforms like edX or Coursera? You know I talked to Andrew periodically about this or is your content? You're building your content yourself.

**Sal Khan:** 26:49

Our content. Historically we've done that in-house, yeah, but we're definitely talking and working with all of the major AI providers folks like Open AI and Google and others to just make sure that we have access to the state of the art and then figure out how to apply it in thoughtful ways.

**Craig Smith:** 27:08

Yeah, again, the promise of this is not only as a teacher's aid, but I'm a lifelong learner and I've actually, I haven't followed through, but because I never took calculus in school and I've taken some of the online AI courses. So I've looked at Khan Academy and thought you know, I need to go back and do all of these building block courses. Do you have people do you see parents, for example, not only in the United States but, as you were saying, around the world who don't have access to quality education, giving this to their kids and saying you know, here you can get the best education in the world if you have a smartphone and an internet connection? Do you see that happening?

**Sal Khan:** 28:16

Yes, and you know, that's our whole reason for being, and it's not happening everywhere, which we would love to see happening, but for sure and we're seeing it on all fronts we're seeing students, teachers, parents putting their students in front of Khan Academy and making sure they use it. A lot of students, especially older students, are starting to use it on their own, and we see a lot of parents and teachers use it to even prepare themselves to learn things that they wish they had learned better, either for something they now need in work or interest, or they want to support their students better. So we're seeing all of you both.

**Craig Smith:** 28:47

Yeah, my wife and I did. As I said, she's an education consultant. She had a contract with the British Council to do a big study in Iraq, which really continues to be a tragic situation there, particularly in education, because they have so few resources. But this is the sort of thing that could be a game changer if it got penetration. So, but one of the challenges is that the level of English in a lot of these markets isn't high enough to engage with educational content in English. Do you have a different language?

**Sal Khan:** 29:40

The content offered in different languages, yeah, Khan Academy already exists in 50 plus languages to different degrees of fidelity, for example, in Spanish or Brazilian, Portuguese or Hindi. It's almost as good as it is in English, and Generative AI adds an interesting dimension to this. So most of the way we've historically been able to localize is we have thousands of volunteers all over the world and even corporate partners that are driving a lot of this work to make that possible, and we build the tools to let them do this. I think Generative AI is going to help localize that. I think we always want a human reviewer at the end of the day or to tweak it, but it'll be able to get it out into more languages quicker. But I think the other really interesting dimension in most of the world, especially when you get into late high school and early college, it's really valuable for students to be able to engage in their academics in English, because that is the lingua franca, so to speak, especially of academia. And so what's interesting about Conmigo and this is relevant even, I think, to the United States is if a student is still comfortable only in their native language, in Spanish and Arabic, whatever it is, but they're trying to now navigate English. It's very hard historically to do that, but with Generative AI, conmigo can. You can look at a problem or video in English and ask questions in Hindi, even in hybrid Spanglish it can talk to, which is actually common for people who are making the crossover between two cultures or two languages. So, yeah, I think this is going to go. It's like, I mean, imagine if every student who I mean even the United States, imagine every Spanish speaking student inside the United States had a one on one bilingual tutor who was also expert in whatever subject they're trying to learn there, to tutor them. That's essentially what we're talking about.

**Craig Smith:** 31:31

Yeah, does it kind of drive you crazy that people aren't doing that or that more people aren't doing that? Again, I have a son of a friend of ours who's with, I think, teach America or one of these organizations and he's in an underprivileged school in Nevada and it's a very frustrating environment for him. And I say, well, have you used any of these tools? And he kind of rolls his eyes. So it's hard enough to get these kids to show up or pay attention, let alone have them engage with a piece of software. But what do you think needs to happen for that to click? And really, because that to me, that's the promise. Not, it's not, you know, the upper middle class, I mean, certainly they'll benefit, but it's the, you know, the underprivileged class that really needs education and this seems like it would be the answer.

**Sal Khan:** 32:50

Yeah, you know, even before we talk generative I it always, it always surprised me as many people are using Khan Academy, know about it, how many people didn't. And you know this requires you know we're happy to partner with politicians and let them take all the credit for it. We don't care . Just tell people it exists and make sure you know what's interesting in a lot of parts of the world. It's interesting especially in poorer parts of the world, including in poorer parts of the United States. People are skeptical of things that are free. That's right. There must be a catch and that's the irony here because affluent families have high usage of Khan Academy, they know that it's better than what they could pay for, and then you have poor families that don't don't fully appreciate that. So we need to and obviously we're working with anyone who we can to build that awareness. Obviously, school districts are one way, but I think we could do more to work with the school districts to build more awareness with parents. I think many parents, if they knew that look, get your child on this two or three sessions a week at 10, 15 minutes, and good things are going to happen to them a lot of parents will at least attempt to do that. And you know, generative AI is still early days and it's, it's, it's. The costs are still a little bit high for everyone. But I'm hopeful that in the next year or two the costs are going to come down dramatically and the richness of the experience is so dramatic that you're going to see a lot more pools.

**Craig Smith:** 34:17

Yeah, and just again because I haven't played around with kind of Migo it's, it's interactive and does it cover? Is it like an interface for all of your content or is it only applied to specific domains?

**Sal Khan:** 34:34

Con Migo applies to all of our content and more. I sound like an infomercial. You know it's a, it's a, it's an add on, so that's why you know we have to charge for that aspect of it. It costs money too. I mean, it costs everything money to run, but even marginally it costs us money to run. But it does everything from whatever topic you're in, whether you're doing a video, article, exercise, it can act as a Socratic tutor. It's not going to give you the answer, but it will ask leading questions, provide support, hints, connections. It'll do the same thing for teachers helping them do lesson plans and things like that. But it also does things that even traditional tutors wouldn't do. It has an activity where you can, where you can talk to simulations of historical characters or literary characters. We have a new feedback, a feedback tool, essay feedback tool. It's not going to write your essay, but it's like an ethical writing coach where it's going to highlight parts of your passage and start threads with you about how you might be able to improve those things. We have activities where it acts as a thoughtful guidance counselor or even life coach, career coach, and so on, and we're adding new things almost on a daily basis, but that's it. It's almost broader than just a tutor or a teaching assistant.

**Craig Smith:** 35:44

Yeah, yeah. At what age do you recommend students start interacting with Khan Amigo or Khan Academy more broadly, so Khan Academy starts pretty young.

**Sal Khan:** 35:58

We actually have an app called Khan Academy Kids. Anyone with, if anyone in anyone's life, is between ages two and seven years old. I encourage them to think I'm not selling anything. It is free. It is funded by philanthropy and I think people are shocked when they see that app. What is in it? Because it's literally equivalent to about 200 apps. There's actually 150 books in it. It's interactive videos, somewhat somewhat magical. Imagine watching a children's video where you can pause and then manipulate the things in the video. That's possible on Khan Academy Kids and it's across all subjects math, reading, writing, character development, like all of the above. So that's Khan Academy Kids, and already approaching two million students every year, every month, are using it, so it's already a large chunk of all kids in that demographic are using it. That one is not using generative AI. Then, once you start getting into second, third grade, that's where you start seeing people use more. I guess you could say the website or the core Khan Academy app, but we've seen students as young as second or third grade use Khan Migo pretty effectively and what we have found a lot of teachers and parents have been telling us it's helping them articulate better what they're asking for, because they get practice asking as much as they want, and that's something I didn't fully appreciate before. I actually saw very young kids use it.

**Craig Smith:** 37:20

Yeah, that's right, the paradigm of one teacher in front of a classroom of 30 people. A lot of kids don't want to ask a question because they're afraid of appearing ignorant in front of their peers. But if you can ask it through a software interface it frees them from that kind of pressure. So there's kind of a blowback against AI, which I think is very unfortunate, and that's spread to the general public. I hear, you know, I talked to friends I'm, you know, all in on everything AI and their attitudes are, by and large, very negative. How do you overcome that? Or do you have, do you run into that, particularly with generative AI, all of the fears about you know, oh, students aren't going to learn to write anymore, they'll just have chat GBD write their papers for them. I mean, personally, I think they've got to learn how to use these things. These are tools, not supplements for creativity. But how do you address that?

**Sal Khan:** 38:50

Yeah, I think people have the right to be skeptical. We've all seen science fiction movies and, yeah, right now the major use cases are on things like cheating. I think it's a job for folks like us to show there's another way that not only mitigates or undermines cheating even pre-AI cheating but actually can provide a much richer environment for people to actually develop those skills. So, on something like writing what we are working on, I just mentioned how Kanmigo already can give you feedback on your essay. Within a year, a teacher is going to be able to assign, say, an essay through Kanmigo. Kanmigo can work on the essay with the student, not do it for them, but give them feedback like an ethical writing coach. And then, when the student feels good about the essay and they submit to the teacher, kanmigo can give the teacher not just the final output of the essay and perhaps even a first pass based on the rubric what the student should get on it, but it can make the entire process of the essay transparent to the teacher. Hey, we worked on this together for about four hours. I helped Craig a little bit with getting a thesis statement. After that, He did this and he had one source that I didn't think was legitimate. So we worked on that together. It took about four hours and, by the way, this is how he performed on the rubric and this writing is actually very consistent with the writing that I've seen Craig do in the classroom. So I feel confident that it is Now. If Craig goes off to chat GPT and this isn't a chat GPT issue there's plenty of websites that for the last 20 years anyone can do a web search. Right now They'll write your essays for you for about $5 a page. This is well before AI. Let's say you use one of those, or your older sister wrote your essay, or you use chat GPT and you just copy and paste it into Kanmigo. Kanmigo is going to tell the teacher like we didn't work on this essay, it just showed up, it looks shady, it's not consistent with what they're doing in class. So what I've described is, on the policing side of things, something that actually undermines all forms of cheating that existed before, not even just generative AI cheating. But it's doing it in a way that actually supports the student better. It's giving them more feedback, they're feeling supported and then the teacher has a much better lens into what's going on with that student. How much time are they spending? What are they having struggles with? And they can get that even summarily reported across all the issues. Like all of your students, or a lot of them, are having trouble with thesis statements, and here's an example of how I've had to help them there. Let's really drill down on that in the classroom.

**Craig Smith:** 41:19

Yeah, yeah. Why don't I let you? Is there a message that you want to bring to the world, or at least to my audience, with Khan Academy?

**Sal Khan:** 41:34

Yeah, I think there's a couple of interesting things to think about. I mean one if we just think about AI very, very, very broadly. I do have broad concerns. Most of my biggest concerns are well outside of the field of education. I worry about a totalitarian government that already can tap phone lines and snoop emails, but there's too much information for them to make sense of. Now, with generative AI they're actually going to be able to make sense of every conversation. They could put microphones on the street. If anyone even whispers that they have some sense of dissent, they might get rounded up. I'm very afraid of that. Now I think there's ways that the good folks can actually undermine that, potentially also using generative AI. I'm happy to talk about that, but I'm afraid of that. Big brother in that world would be much bigger of a brother than anything George Orwell imagined. So that's scary. I'm afraid of criminal organizations, misinformation, phishing attacks, also third party external governments doing misinformation, manipulating sentiment in this country, political elections, et cetera. That's all very scary. But once again, I think there's ways to police that and I think on the positive side it's going to really level the playing field and then some for things like education. It's going to help teachers. It's going to give even things like. I know this sounds almost too right now when people there's a loneliness crisis in the United States. There is a mental health crisis in the United States, and I'm not going to pretend that you can use an AI to substitute what a good community could do. Honestly, even today, I think people substitute things like therapy for what a good community could do. Absolutely yeah, and therapy, I think, can also be very valuable, but that's also extremely hard to reach and when someone's in a dark moment or having an issue, they usually don't have someone to talk to right at that moment. So I wouldn't be surprised if, in the next five, 10 years, you're going to see research studies where it's like, wow, this is actually helping people with their mental health. It's helping people deal with stress. It's helping people become more mindful about themselves, that they are forming bonds and some people might say it's an artificial bond but at the end of the day, if it can help people live their lives better, I think this could be a very positive thing.

**Craig Smith:** 43:56

AI might be the most important new computer technology ever. It's storming every industry and literally billions of dollars are being invested, so buckle up. The problem is that AI needs a lot of speed and processing power. So how do you compete without cost spiraling out of control? It's time to upgrade to the next generation of the cloud Oracle Cloud Infrastructure, or OCI. Oci is a single platform for your infrastructure, database, application development and AI needs. Oci has four to eight times the bandwidth of other clouds, offers one consistent price instead of variable regional pricing and, of course, nobody does data better than Oracle. So now you can train your AI models at twice the speed and less than half the cost of other clouds. If you want to do more and spend less, like Uber 8x8, and Databricks Mosaic, take a free test drive of OCI at oracle com slash ion AI. That's oracle.com slash ion AI. That's it for this episode. I want to thank Sal for his time. If you want to read a transcript of today's conversation, you can find one on our website. Ion AI that's e-y-e-onai. In the meantime, remember the singularity may not be near, but AI is already changing your world, so pay attention.