Q&A with Paul Kellenberger, CEO of zSpace, Inc. bringing Augmented Reality and Virtual Reality Technology to the Education Space that Makes Learning Come Alive

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"zSpace is a combination of augmented reality and virtual reality technology that is bundled into a complete powerful solution... In terms of a real business and real value, zSpace is at the top of the list in the AR/VR market." - Paul Kellenberger

CEOCFO: Mr. Kellenberger, what is zSpace? How do you provide the ultimate learning experience as mentioned on your site?

Mr. Kellenberger: zSpace is a very unique experience. We call it the ultimate learning experience. zSpace is a combination of augmented reality and virtual reality technology that is bundled into a complete powerful solution. Let me talk briefly about the components and then talk about specifically education, which is really our current major market focus. There is a display and interaction component which, in today’s current form factor is an all in one mixed reality computer system. This is the hardware component. There are a set of applications that really bring the technology alive. This is the software component. Our initial focus, about four years ago, when we got started in the education field, was on these hardware and software components. Now, we have expanded much beyond that to include the third component that we call content, to describe the key enablers that make it easy for teachers and students to use zSpace. First, we created hundreds of lesson plans that make it easier for teachers to use zSpace in the classroom. Second, we aligned those plans to standards like Common Core and NGSS (Next Generation Science Standards). The last component of the overall zSpace experience are the services required to deliver zSpace, which is the professional development, teacher training, and the implementation to bring it into the classroom. The value proposition, which goes back to “what is zSpace”, is that zSpace is so unique that it really engages students in the learning experience. There are many different examples that I could talk about, but all will demonstrate that zSpace makes learning come alive and quite frankly get students interested in subjects that they may not otherwise be interested in.

CEOCFO: How does it work? How do you engage students?
Mr. Kellenberger: The most important pieces on the engagement side are the applications and the content. For example, in early to middle grade science, as opposed to dissecting a frog, as in a real frog cadaver,
you can do it virtually. Because zSpace makes the frog seem real and allows the student to interact with it as if it is real, although you can look at videos of students using zSpace, you really need to experience it yourself to understand the engagement. It is so unique it is extremely difficult to describe. We created the ability to make videos in real time to help people visualize and understand, but it does not replace experiencing zSpace for yourself. The engagement on the part of the students and the excitement related to learning, with many core courses in many different subject areas is what really gets them interested and excited.

**CEOCFO:** *What have you developed that is different than other products currently available?*

**Mr. Kellenberger:** We are the only ones in our own class and have a very unique solution. We are display based. When I say display based, it uses an all in one computer that could be different form factors. The current one is the one you see on our website. Virtually, all of the other players in the AR/VR space are what I call either “goggles based”, like an Oculus, which is one hundred percent fully immersive or more in the augmented reality space, like a HoloLens from Microsoft. Another difference is that we have a complete solution for education. Again, we developed the hardware component. We also developed some of the applications on our own and have a well developed third party ecosystem. As I mentioned, the other components of our solution are the content and services for the education market, which has really been growing and growing very rapidly; these components we built or deliver ourselves as well. By the way, nobody is doing anything like this in the VR/AR space today.

**CEOCFO:** *Do people believe before they see it? How do you get people to take a look?*

**Mr. Kellenberger:** That is a great question! Today, in the education market we actually have what we call mobile labs. This year we have been running four of them. The way we sell is typically two students per zSpace system. We have these mobile labs which are either like a trailer or a bus. We go school district to school district. The bus pulls up and there are sixteen zSpace systems, including the teacher workstation, set up. We literally will bring administrators from the school district, educators from the school and classrooms of students to come in and experience zSpace. Again, this is kind of “seeing is believing”, so we actually show people first hand. In the education market, in the United States in particular, we go to all the major education conferences and show people. Within the company about seventy five percent of our business today is in the United States. We are in about six hundred school districts across the US. China is our second market and growing extremely quickly as well. We are also in about one hundred and fifty Universities, worldwide as well.

**CEOCFO:** *How do schools evaluate the cost against the potential results? How do you help them see that?*

**Mr. Kellenberger:** We have some tools. There are a couple of studies that have come out. One of them was a top-level study out of NC State. They studied students who learned the traditional way and students who learned using zSpace. The one objective number I can give you is about a forty percent better retention of information, because the students are engaged. They are learning by doing. They are actually doing something virtually that they otherwise might just be just reading about or looking at
There is some other efficacy data, but again I would say that the biggest thing schools are looking at, as a part of their whole buying process, is engaging people in all the different disciplines: administrators, teachers and students. When we started several years ago, the question was whether we were a nice to have or a must have. I think we have moved on to that must have category. That is why our business has really exploded over the course of the last couple of years.

**CEOCFO:** Do students initially play with what your experience and then just learn because you cannot help but learn or do follow the learning steps immediately?  

**Mr. Kellenberger:** One thing is for sure, in the K-12 age range, or really grade 2 to grade 12 where we focus; kids nowadays are incredibly technologically savvy. They pick this up so quickly that sometimes it is unbelievable! I have been in situations in school districts where kids will literally, within a few minutes, have mastered the entire user interface. They pick it up extremely quickly! In relation to your question about how they go about it, in terms of playing with our experience; we have been in the education vertical market now for about four and a half years, and when we first started much of what was initially done was in after school programs. The kind of buzz words that were used were “letting students discover,” “encouraging critical thinking” and “inspiring curiosity.” In the first year to eighteen months we were really in that category. With the development of additional applications and as I mentioned the content, including lesson plan development, we have moved into the main stream education process, connected to the core curriculum. However, many schools still allow the students to explore and do more with zSpace on their own time. Therefore, it is a little bit of both. We really started, as you described, with them playing with something, having fun and getting interested but we have moved more into the core of the curriculum over the last couple of years.

**CEOCFO:** Did you say one unit per two students?  

**Mr. Kellenberger:** Yes. By the way, usually the average class size is about twenty-five to thirty, so usually that means twelve to sixteen systems that make up a lab.

**CEOCFO:** Do students have their own glasses?  

**Mr. Kellenberger:** Yes. You can see from the videos on our website, that our stylus, which is Version.1 of the user interface, is what students use to interact with virtual objects. The two students use slightly different eyewear. One is the driver and the other, the passenger, is concerned with learning. Therefore, learning is very collaborative. When you think about using zSpace, one of the benefits that we learned over the last few years, is that although one of the students will be driving the experience, the two of them will be discussing what is going on. By the way, in China it is a three to one ratio, but I will stick to the US for right now. Students will talk about what it is they are learning, human anatomy for example, and then they will switch and the other student will then be the one who is experiencing first hand while the other one is watching. We have done a pretty good job in terms of workflow, use cases and creating value in the learning environment. There is something else that we do not show on our website or in our videos, but it is a “one-to-many” capability. The teacher has a workstation, that they can plug in directly to a projector, smartboard or a TV, and use a software program that we created called zView, to show the students what they will experience, in advance. They might say, “Today we are going to learn about human anatomy,” and they will actually walk the students through what they want them to go
learn about and experience on their own. Then the students go do it on their own. There are some other elements to this that you do not see on the videos, but are part of our entire workflow.

CEOCFO: Would school districts that have less advanced students see this as a way for them to learn instead of books? However, on the other hand, does that stop kids from understanding some of the basics that you really do want to read about?
Mr. Kellenberger: There are some schools that we work with that use zSpace with special education kids. I know of a couple of stories in schools where students that really were not engaged in wanting to learn, got really excited about learning. Those examples do exist. I think that in general there is a lot of reading of books that still happens. We know we have not replaced the physical world with the virtual world. I think the most important piece is to marry the two together in the entire learning experience. Difficult or abstract concepts that are hard to comprehend, really shine the most in zSpace. We also find many schools using zSpace to “level the playing field” by allowing all students to build their background, or basic, knowledge, as they require and at their own pace.

CEOCFO: How often do you change the programs and the software? When do you decide that there needs to be something newer?
Mr. Kellenberger: We are on a traditional school cycle where we refresh things for back to school, which is now and already happening in certain states like California, and at the beginning of the year, so after Christmas. At these times, we do large updates and refresh all necessary content. In addition, like every software company, we push the upgrades and updates on an ongoing basis, if the schools want to do it on an ongoing basis. For example, as you mentioned, we have a chemistry application and a physics application. Throughout the year, we work to bring in more and more content, such as new or modified lessons and activities, within those applications. We have also delivered much more high school content, including medical anatomy training applications. Globally, we are seeing a growing need and interest in vocational or CTE (Career and Technical Education) programs. We have a partner who has nine zSpace modules about automobiles that are being used in vocational schools; the engine, the HVAC, the suspension system, the brake assembly and so on. For example, Clark County, which is one of the largest school districts in the United States in the Las Vegas area, has a very large CTE and vocational training program using zSpace. For the hardware component of zSpace, we refresh as technology demands or new capabilities are developed, not unlike other computer technologies. However, we update the applications and content all the time, working with a set of schools to gather feedback on how to make things better, and where appropriate find other third party applications to bring onto the platform to fill specific needs, like the automotive application I previously mentioned.

CEOCFO: What is the business model?
Mr. Kellenberger: Today, the primary one in our education market is a solution sale. In addition, we have moved to a more recurring revenue model. We call it ZaaS, zSpace as a Service, where we sell the hardware, the applications, the content and the services, including professional development and implementation, as a bundle. In round numbers, it costs about twenty-two to twenty-three thousand dollars per year for a zSpace lab complete solution that would go into a school.
Originally, we sold a zSpace lab more of a solutions provider, where we would sell the hardware and all the components. Some schools still like to buy that way, where they pay for it up front. However, we are moving towards a service recurring revenue model.

**CEOCFO: Do you know what a school or school district is using so that you can see what is most popular or what is not getting traction? Do you monitor that at all?**

Mr. Kellenberger: We do. We do it in a couple of different ways. We do have some analytics built into our system for the school who opt into it. Not all of them will opt into it. We can actually keep tabs on the usage of the different applications, which allows us to, in conjunction with talking to the teachers and the users, modify the applications to make them even more useful. We also get that feedback directly from teachers and school administrators, because for all of us this is really about value and growing the usage of zSpace.

**CEOCFO: What is not getting the traction that you would expect? What topics are getting more attention? In both areas, what surprised you?**

Mr. Kellenberger: If you are teaching english and reading, there is not as much to get engaged with in zSpace. As I mentioned when we started, that is an area where zSpace is not going to add as much excitement, at least based upon the way we think about things today. When we first began we started with science. That was our major focus and we got great traction there. We then broadened into the larger STEM (Science, Technology, Engineering, Math) area and now have even gone beyond that. There is a lot of information on our website that we probably do not have time to go through, but we have an incredible amount of content and applications across the board. This is my fifth startup of a small company. I have been with this one since the very beginning. The growth has been astounding, particularly over the last three years! We only started this four and a half years ago, so there is not anything I would put in the “not getting traction” category, other than possibly English and reading where you are reading books and doing book reviews and so on, which does not lend itself to the virtual environment. I think there are many exciting things in the areas of math, for example. There are a couple of different apps that we have today and one is a thirty-party application called GeoGebra, which we did not develop, but is very popular. Also, when you think about the notion of math manipulatives and combining both the virtual and the real world in the learning process it can be extremely powerful!

**CEOCFO: Why pay attention to zSpace?**

Mr. Kellenberger: I would say today, because we have more real revenue than others in our category, and when I say real revenue, I mean beyond developers. Many of the current AR/VR companies that are in the market have been really focused on developers. In terms of a real business and real value, zSpace is at the top of the list in the AR/VR market. I have been told that by many people. It is not just because I am the CEO of the company that I am saying that. That is number one. Number two; the AR/VR market is in its infancy and will experience incredible growth in the next few years. We have made the decision to treat the education market as our core market. However, it is not the only market that we are focused on. For example, we have several partners and third parties that are focused on other markets, like the medical market. We are providing the platform and the underlying
hardware/software development environment for others to go and expand. We are also working on different form factors of our product, not just the current version we are shipping, that can take us in to any market. A huge opportunity exists as demonstrated by our early success and all the numbers that have been kicked around in analyst reports about AR/VR growth over the next five to ten years. Those are the two main reasons.