

What should districts know and do about their IT infrastructure when embarking on a 1:1 initiative?

An interview with experts from R-Options – Randy DeVos and Patrick Cross

Interview conducted by Raffaella Borasi and Dave Miller, Center for Learning in the Digital Age, © 2019



Randy DeVos, President/CEO

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There's nothing worse than having a district spend all that money for equipment and then have things fall apart at the very last hour so we want to make sure this does not happen

Randy DeVos – R-Options

1. What should a district starting a 1:1 initiative do first?

Patrick: First, they need to **develop an instructional plan** for how they want technology to be used by teachers and students. You really need to have an understanding of where you're going and what you want to do before you start buying and installing products that might not be the best for your end plan.

It would also be very useful to **call together all the vendors before key decisions are made**. It's good to have communication between the people that are putting in the cabling and the people in charge of the equipment being installed to make sure that the flow is smooth. It doesn't happen very often, and I think that's a mistake. Everybody should be at the table at the beginning to discuss plans and make sure that they're we're all going down the right road together.

Randy: Once you have a technology plan, then **get a thorough evaluation of your system** done by experts. That will lead to a better plan for what needs to be done – making sure that you know you've got the wiring closets in the right locations, you've got the right fiber cabling, you've got the right rack-mount systems to support whatever gear and devices we need to put in there, and then all the cabling out to the station locations are accurately placed. You also need to get all the parties involved to work together to make sure that once the design is implemented, everything is installed without a flaw.

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2. What questions do you ask a district that calls you in to update their IT infrastructure?

Randy: First of all, **what is your vision for instructional technology?** We need to know what they're trying to do as far as teaching into the future – so we can determine if they have the right hardware to support what they're about to do and if their network is going to handle the types and amount of data they're about to put on it.

What hardware are you purchasing to support what you want to do? What kinds of devices will you be using and what network speed would those devices require to work smoothly?

Have you done a cabling and network analysis? What do you have currently running on your network? Do you know what your current network can handle and if it is sufficient to support what you are about to put on it? What is your weakest link?

Do you have a technology plan? Do you have a plan put together that's going to support what you're trying to do with your network to support the kind of teaching you are promoting?

What is your budget? Can you secure the funding to do what needs to be done to make your initiative work?

What is your timeframe? If you've got the funds and have to spend them before a certain date there's no time for delay. If you instead still need to secure the funding, take time to do a systematic evaluation and planning – as it may eventually save you time and money.

What kinds of support will your district need on an on-going basis? Does your IT team have sufficient internal capacity to handle infrastructure problems, or will you need to ensure some kind of external support?

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3. Why should you develop a “future-proof” technology plan?

Patrick: One of the most important things is to look not just at what technology is being used now, but also at what we see coming in the future and try to “future-proof” yourselves so you're able to accommodate new products.

Randy: Technologies grow so fast! 33 years ago I was installing rotary phones brand-new-out-of-the-box. Now I look at people holding computers in their hands that they call a telephone. And technology is accelerating faster than it has in the last 30 years -- you need to think about your future now because by the time you put your technology in place if you're cabling infrastructure is not there to support, then you're only going to be as strong as your weakest link.

Patrick: Technology leapfrogs and progresses so quickly! Everyone will say, “well, we have fiber optic” - but do you have the newest fiber optic? “We have Wi-Fi in all of our rooms” – but what type of Wi-Fi do you have? Wi-Fi is a general term that everybody uses, but there's all sorts of different levels of Wi-Fi, and you want to make sure that you have a smooth stream going to that Wi-Fi device so you're taking full advantage of what you have purchased. You may have purchased a whole new Cisco system and had it installed, but if it's not in the right places and it doesn't have the right support, then you're not getting your full benefits out of it.

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4. Why is bandwidth so important?

Patrick: Bandwidth is what ensures that there's no delays on the network when viewing a movie, or having students access the Internet. You really want to have a seamless network and make sure that the speed and the demand is there for you – and you're only as strong as your weakest point is. Every Wi-Fi access point only allows so many users, it's only got so much bandwidth – so you want to make certain that you have enough equipment there to support all the devices that are going to be using that wireless access point. For example, in today's “classrooms on the futures” we are putting a wireless access point in every single classroom so as to allow for 40-45 users.

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5. What does it mean to do a comprehensive system evaluation, and what is its value?

Randy: It is critical to do an evaluation on your current system before taking any action. Maybe you already have a cable infrastructure that works well with what you are currently doing. But when you start introducing higher demand and higher speeds you may get some loss of information that will make you lose productivity – and that always equates down to dollars and cents.

Patrick: When we do a school's infrastructure evaluation, we go from the beginning to the end of the stream and make sure that the entire stream of your technology is all one easy flow, there's no dams no log jams or anything of that nature in your technology – or that's what's going to cause all your headaches!

Randy: A typical problem that we encounter when we are called to do this kind of evaluation for schools is finding poor installation. We may find cabling that's been installed close to light fixtures or sometimes sharing electrical conduit – which is totally against NEC codes – causing interference and such; and when you start getting that types of interference on your cabling it will affect everybody on the network, slowing things down. We find cabling that is out of spec, too long, hanging out of the ceiling, not put inside the wall cavity where it's supposed to be... Improper installation is what we see a lot, and that of course reflects on speed and connectivity.

Randy: A systematic infrastructure evaluation can save a district a lot of money! For example, when we were called to evaluate East Irondequoit's network, we went through and evaluated every single closet, we took pictures of every fire stop sleeve and made sure that if they ever got audited they were up to code; we went through every single classroom and found several inconsistencies - so we put it all on a set of drawings and documented it and we made out diagrams and pictures and gave them to the district. This made them realize that they did not need to rewire the whole district but rather only replace 2,500 of their 5,500 cables. Because of that evaluation they saved money and time. And the district also got drawings for every closet and for every building, showing all the drop locations, cable IDs, pathways – which will make trouble-shooting and repairs a lot easier.

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6. What is a “closet-clean-up” and why should districts do it?

Patrick: Many schools have closets that are functional and are working right, but if you need to fix a specific cable it'd take you 10 minutes to find out where it is because there's so many cables hanging over. That just opens up the opportunities for many types of problems. Once you do a closet clean up, school IT staff can easily get access to all their equipment, know where everything is, find what the problem is and quickly solve it – like, find a patch panel that's wrong or something that's been loosened, tighten all that stuff up and get it back to where it was originally.

Randy: From the IT management standpoint, having a more organized cable plan allows them to locate issues and fix them on a rapid pace versus spending two to three hours trying to locate a cable or where it was connected. That's going to be a huge advantage for the IT department when a teacher calls because she can't connect any of their devices to the Wi-Fi!

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7. How can different technology service providers work effectively together?

Patrick: Once a district has decided what products they're going to use, who they are going to buy them from, who is going to do the installation and infrastructure work, and who will provide the on-going support, it is important to call together all those people so as to establish good communication. That's not always done, sometimes infrastructure is kept separate from the actual technology that's being installed and I think that's a mistake.

I think it's always good to have communication - for example, we could be putting in a Wi-Fi device and it's a certain distance away; we know as it gets farther away it's taking more power and then it's putting more pressure on that cable; we know that there are other types of cable that wouldn't burn out the Wi-Fi, so we could use those cables instead.

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8. What should a district consider when looking for an outside provider to help with IT infrastructure?

Randy: Well, references is number one, making sure that they're a qualified contractor, and getting some examples of their work. I think a lot of schools solicit three different vendors and take the lowest bidder. In my mind it's not always about the price, it should be about whether or not that vendor will do a great job for you, and how well that vendor cares about your system. You want a vendor that wants to be a part of the project and have some passion about what they do, that will ask you "What are you putting on the network? What are you trying to accomplish?", and then help you design around that. Maybe you don't need CAT6, which is very expensive, or maybe you do want the CAT6 because of your future plans.

Patrick: I also think it's important for school systems and IT Directors to try to be more proactive, as opposed to reacting to problems. It is valuable to take a look at the current system and discuss future opportunities with an expert, so they can put together a plan and choose an appropriate time to execute it. For example, summer is more desirable, because that's the period of time we can get into the school and actually have access to the building. But if instead we're not finding out what types of issues there are until the week before school starts, then everyone is in a rush to try to get things finished and fixed. If we're proactive as opposed to reactive, things can be done in time and we can do the proper testing to make sure everything is properly installed - so when the school year does start everything is smooth, and all the teachers can use everything from day one the way it's designed to be used.

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