

Topic:
Education

Supplying CAD software to universities and colleges – what's the point?

The relationship between CAD/CAM seat numbers and the number of employees per site.

iCAD is produced by Business Advantage, a B2B research, business development and marketing consulting practice operating in the global IT, Digital and Telecommunication sectors.

A number of CAD vendors have refocused their efforts on the academic world in recent years. In an area where profit margins tend to be low, what are the opportunities for vendors and their channel partners? What are they getting in return for these efforts? We spoke to representatives from Autodesk, Bentley, IBM and SolidWorks for the vendors' perspective, and to Newcastle University in England, Saarland University in Germany and the Architectural Association School of Architecture in London for the academics' view.

Naturally, CAD vendors set out lofty ambitions for their academic programmes, often with more than a hint of altruism. The mission of the Bentley Education Network (BEN) is described as *"to re-invest its academic revenues in the community that is creating the future's engineers and architects....we believe we are shouldering our share of society's responsibility for robust infrastructure - and helping to create a stronger safer tomorrow."*

[The Bentley Educational Network](#) was established in April 2000 (August 2000 in Europe). It currently has 280 European universities on the programme (including some 'high schools' in certain countries that cater for 18-23 year olds).

Creating Demand

Clearly though vendors would not be targeting the academic world if they didn't anticipate gains in the future.

So can the exposure of students to a particular CAD package increase future demand? *"We're aiming to promote CATIA and expose students to the benefits of a high end tool,"* explains Nigel Rose, New Business Development Manager, IBM Product Lifecycle Management Solutions. *"Newly employed graduates themselves are not normally decision makers, but they can influence decisions. Where you could see them as agents for change is in small-medium sized enterprises where they might go in for much smaller drawing offices which will be 2D CAD literate - introducing someone there who has 3D skills is clearly a benefit."*

IBM and Dassault Systemes have set up [HEAT](#), the Higher Education and Training Programme for universities, colleges and research groups within accredited institutions. Programs and offerings are tailored to suit the specific needs of educational establishments in different countries.

Karen Williams, Education & Anti Piracy Manager for Autodesk UK and Ireland, also feels size is a factor: *"In the long term, our activity does influence commerce. In a lot of the small organisations graduates are required to set things up and show their colleagues the way forward. We find students who have used AutoCAD saying: 'I learnt this at college and I'm going to advise the company to buy x copies because I'm the head of the department,' or 'I'm the wiz kid who's done CAD, so they're going to buy me whatever product I want, and I want what I learnt in college'."*

Rob Davidson, lecturer at Newcastle University's Department of Materials and Manufacturing Engineering, provides the proof that this can happen. *"One of my students who used Mechanical Desktop during a Teaching Company scheme (a partnership between a university and a local company) is now working at another company as a CAD manager over 10-12 staff - Mechanical Desktop is now being actively considered for his new company."*

Newcastle University agreed a contract with Autodesk last year for the installation of 600 seats covering a wide range of AutoCAD based applications.

Meeting Demand

Rosanne Kramer, Director of Education Markets for SolidWorks, stresses the importance of their education programme in meeting the demand for skilled users of a successful product: *"Our business objective is to promote an effective synergy between education and industry. Our perspective is that the demands and trends of one market influence the demands and trends of the other and therefore, both markets need each other to move technology forward."*

The [SolidWorks Education Programme](#) is in its fourth year; SolidWorks is being used at over 3,000 academic institutions worldwide, with the installed base split evenly between Europe, the Americas and Asia.

Bright students on sexy projects also bring PR benefits. *"It's clearly beneficial from the level of publicity we are getting from university projects,"* says Nigel Rose. *"For example we've got a university designing the next generation of electric land speed record car."*

Newcastle University's Rob Davidson raises a further benefit: *"Many companies ring us each year asking for advice on CAD/CAM systems. I haven't got time to be familiar with every CAD system so I'll talk about those I know and have available."*

Missing Links

With many universities and other institutions often housing high levels of industrial experience and close links to commercial companies, the scope exists for closer relationships. There was a feeling generally among the academic representatives we spoke to that these opportunities are not fully exploited.

Bentley uses resellers in some European countries to build strong links with academia, and work with users directly in other countries where relationships with resellers are less well established. Zeljko Djuretic feels that BEN is ahead of the game in this area. *"Most companies are providing academic institutions with discounted pricing, but this can be translated as just a sales policy - if you can't sell it at a higher price, you reduce it. In addition to significant discounts, BEN sponsors research and development projects, creates curricula, trains educators and establishes connections between commercial organisations and universities. I do believe that other vendors will have to follow; otherwise, they'll lose their market share. We have a relationship with our academic users. We are creating a community with our academic users, a place where they can collaborate amongst themselves, communicate with our research and development, and even exchange their ideas worldwide."*



Zeljko Djuretic, BEN

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The Architectural Association's School of Architecture in London is a BEN subscriber. Unit Master Martha LaGess explains: *"Bentley's excellent BEN initiative makes the company far more proactive in the academic arena. But most CAD vendors do not seem to realize that academics could play an important role in their future success - not only in terms of market penetration, but also in product development. CAD companies should work with academia to research the design, construction, and operations process as a whole. This research would enable companies specialising in architectural computing to create product suites that would enable smooth transitions between the often-contradictory requirements of successive project work phases. CAD companies, architects, and indeed the entire AEC industry could benefit."*

Christian Weber from the Institute of Engineering Design at Saarland University in Germany, feels the location of the major CAD/CAM vendors is a factor. *"In Germany there is only a very marginal CAD/CAM/CAE industry left. The international - usually American - developers are represented here by sales offices or sales partners who are rarely involved in software development. So the interest in what is going on in the research departments of German universities is usually not very big. But there are things going on that the industry should have a look at. There are a lot of new CAx software concepts and prototypes being developed here. The main focus is on extending the application of tools into the early phases of the product development process and of getting more "design knowledge" into the systems and product models.*

However, the "down-side" of these new systems and prototypes is that geometry-processing - still the CAD/CAM/CAE-developers' main business today - is no longer the most important aspect. This may be the reason why the CAD/CAM/CAE industry sometimes does not like what it is readily invited to see."

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Service Provision – The Vendor view

It's accepted that generous discounts are required for academic institutions. To what extent do they receive/expect other support? All the vendors we spoke to stressed the importance of VARs in developing flexible relationships with them.

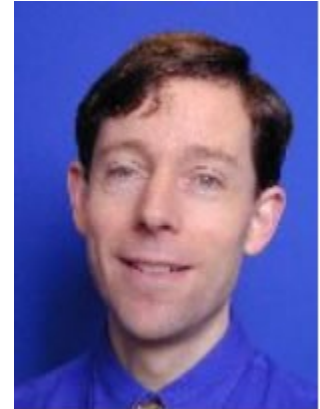
"In the UK, for example, two companies - Solid Base and NT CAD/CAM - have done an excellent job of drawing the leading design and engineering schools into the greater SolidWorks user community," reports Rosanne Kramer. "They include the academic community in all their marketing programmes, and always make them aware of industry events that are going. SolidWorks has an annual subscription based license, and once a year the licence will be renewed and upgraded. If there is the need for any kind of training or upgrade training, the reseller is there to provide it. Fees for training are charged on a case-by-case basis. Local resellers also facilitate the academic institution's involvement in a local user group, or participation in seminars, and they also work with the school to facilitate the establishment of job referrals or recruiting networks."

Service Provision – The Academic view

But what do the universities really want from suppliers? Newcastle University's Rob Davidson presents his wish list:

"Automatic upgrades - we don't get these at the moment. These should be offered (but not forced on us, of course).

Free training - two entirely different support policies are needed for industry and universities. They must understand that the biggest thing we have to offer is exposure to students in large numbers (I alone teach hundreds per year). In university, getting a new wizzo CAD system creates a lot of work, with me or one of my colleagues having to spend their summer implementing it, learning it, and preparing teaching materials. All I get personally from a shiny new CAD system is a fresh lot of trouble! So we need free training. In the past, I've had to teach AutoCAD 12 and 13 without any training at all - it was ridiculous. And it's no good charging us £350 a day for training - the money's not there.



Rob Davidson
Newcastle University

Virtually free support - anything more than £100 per year and we're not interested. Remote installation and remote maintenance - the networking ability of many of the CAD systems is not all it's cracked up to be. So the facilities for remote installation and remote maintenance of it are essential.

It mustn't stomp over every other programme - there is an assumption in most CAD, and particularly CAM systems that they are run on dedicated PCs. In our experience they are seldom on dedicated PCs: they certainly are not in universities.

There needs to be a cheap version that the students can buy/rent/borrow - selling Educational Mechanical Desktop, I must have processed about 10 or 20 copies this year for our students (it's all legal!). But asking them to pay more than £350 is not on: it divides the class into those that can pay and those that can't. They should only have to pay about £50 for something that's going to last them the 4 years of their course. It's very difficult expecting students to only do this work in normal university opening hours; they need to be able to use it at home.

Learning friendly - CAD systems must not assume that the users will be doing nothing but using their system. Please make it as intuitive as possible."

The Profit Factor

Can resellers specialising in the academic market make any money? "It depends on the environment," says IBM's Nigel Rose. "Clearly they are not doing it as a charity. But our experience is that, although they are not making a high profit from selling CATIA or associated training, there are opportunities for selling hardware, so overall they are better than breaking even. This has always been the challenge of selling to universities. But having said that, if a university is looking to buy multiple seats, then the order value starts getting significant for the university and reasonably profitable for the supplier. In addition, of course, there are the longer term benefits of having CATIA trained students coming into Industry."

Autodesk's pricing policy for academia confirms the slim profit margins available. "AutoCAD for Education is £245 for one copy," explains Karen Williams, "while in the commercial environment it's £3,100. So they are getting a small cut. The resellers that are purely educational tend to sell other people's software as well, such as Adobe and Macromedia, and that's how they get a foot in the door. They're obviously making money out of it otherwise they'd go out of business. Most of them are growing and getting new people, so that shows the market must be growing."

"I think the payback is of more a long term and indirect nature," says Solidworks' Rosanne Kramer. "The reseller is in a position to promote and develop the synergy between education and industry. For example, someone in an academic institution might hear about SolidWorks and bring it to the attention of a company, and it could then turn into a commercial prospect."

"...when a reseller is proactively involved in education it enhances their commercial business in every single instance."

Or, some of the existing commercial companies that we are already working with have children going to college, and if these executives from major manufacturers see the kind of benefits the company is deriving as a result of using SolidWorks, they may recommend it for the college. We have seen that when a reseller is proactively involved in education it enhances their commercial business in every single instance e.g. through indirect referrals, higher profile etc."

European Variations

Different university funding mechanisms in European countries call for different approaches. "The BEN programme itself is the same across Europe, but the difference lies in how we deliver the software," explains Zeljko Djuretic. "In some countries, like the UK, students pay for the education, so the universities have a budget and may prefer to be on a subscription programme involving the payment of an annual fee, and receipt of all new upgrades. But in other countries, like Italy or Germany, universities do not have a regular budget. The fact that they get money this year does not guarantee funding the next year, so they have to be careful how they spend the funds and often a 'one off' fee is preferable."

The School Market

It's a natural step to try and reach young people at the earliest possible opportunity. Schools are increasingly the target of vendors' educational programmes. This has become particularly relevant in the UK, where CAD/CAM has just been put in the curriculum. *"The big opportunity is targeting schools," explains Karen Williams. "You have to wait for them to realise they need something to use before you present your products. Targeting colleges that support schools will also be important. I'm finding that more and more colleges see having CAD teaching capacity as a way of getting school leavers to come to their college; it's a seeding process."*

BEN also sees secondary schools (age 13-18) as the next phase in their programme in the UK. *"I see this as another part of the chain," says Zeljko Djuretic; "it would be easier for universities if students from schools are trained on the same software. The ultimate goal is the same - to have as many kids as possible using Bentley software." With schools having even less money than universities, benefits to suppliers will be even less direct. "We have appropriate prices and products for those schools," explains Zeljko. "Convincing local government of the benefit of our applications will also be important, as most of the secondary schools' budgets are allocated through them."*

Schools present the added complication that very few are likely to have staff with any in-depth knowledge of CAD. *"We're developing more ancillary materials," says Rosanne Kramer. "We are publishing the SolidWorks 2001 teacher guides and student workbook, which will be available for the coming academic year. This is a complete, comprehensive, competency-based approach to teaching 3D solid modelling. It's an 8 week lesson plan with a syllabus, course outlines, homework assignments, quizzes, exercises, reproducible handouts - everything that the teacher needs to teach a course not just on how to use SolidWorks but pretty much the fundamentals of descriptive geometry and design concepts."* With countries across Europe operating different curricula, vendors will need to make the most of their local partnerships to ensure such materials meet local needs.

The E-Factor

Will graduates play a role in encouraging their future employers to adopt web-based collaborative solutions? Bentley sees this as an important factor. *"We allow them access to our collaborative tool, ProjectBank, and Internet-based project hosting service, Viecon, free of charge," says Zeljko Djuretic. "Once someone experiences the benefits of this collaboration, they don't want to work without it. So when the student starts working for a commercial organisation, he will ask for it."*

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Getting students to really appreciate the benefits of web-based solutions can be harder in practice. *"We do cover the theory of it and the fact that this type of working and communication is available, and we show them demos," explains Rob Davidson. "But there's only a certain amount of market leading we can do. There are people doing work on that elsewhere in the university. But the practicalities of teaching it and properly experiencing it are fairly unmanageable."*

The Vendor Challenge

Newcastle University is unusual in its decision to install a suite of CAD software from the same vendor rather than teach with multiple products. This phenomenon will concern other vendors if further universities adopt this model. Would Newcastle consider changing their approach? *"It would take several things for us to change, but the main one concerns our long term relationship with Autodesk and with our local suppliers," says Rob Davidson. "If we look at the individual application areas, architecture for example, there are a number of packages mounting a serious challenge. But provided that Autodesk continues to offer sensible things in easily swallowed ways, and doesn't offer prehistoric monsters, then we'll still be in there with them I reckon."*

"But it's important too, that as things like Inventor come on the scene, that they don't refuse to talk to all the other AutoCAD bits and bobs. The reason we've gone for Autodesk is the very good integration across the vast area of programmes. If they go off and try and 'out-SolidWorks' SolidWorks or 'out-Pro Engineer' Pro Engineer, that's fine but they must be careful not to lose their advantage of being able to talk seamlessly to all the other applications, from architecture to visualisations."

"I would be willing for CAD vendors to come in and do demos as lectures, but they must understand the context of their product and not just do a sales pitch. It would be helpful for example if they were to highlight the limitations of the solid modeller and what it can't do, and how much time it takes; this information is really not available."

Alternative Angle

Newcastle University's decision to enter into such an extensive agreement with Autodesk is the exception rather than the norm, and the attitude towards competing vendors at Saarland University may be a more common one.

"My belief is that it does not really matter which particular system you use in teaching"

"From a human resources point of view it is impossible to become familiar with more than two or three systems at a university," says Christian Weber. "My belief is that it does not really matter which particular system(s) you use in teaching, because it is more important that students learn the basic techniques rather than becoming an expert user of one system. Sure, certain industries sometimes expect people to be trained in a particular system. But as these expectations vary between industries, it is impossible to fulfil them all. I strictly refuse to bother because we want to train people in designing and manufacturing whatever the product."



**Christian Weber,
Saarland University,
Germany**

Rosy Future

While vendors are tending to measure the success of their educational programmes through the number of academic institutions signed up, the long-term benefits they are seeking are very hard to measure. But clearly all parties can gain further through developing more proactive relationships. *"We'll have to wait and see what today's students will bring to tomorrow's industry," says Rosanne Kramer. "But, we're already seeing extraordinary developments in such areas as bio-medical technology, where SolidWorks is being used - wonderfully innovative products. So, I imagine that level of innovation will continue as these young designers come into the workforce."*

If you want to find out more about the levels of awareness of your products and services in universities/colleges around the world, or if you are interested in what impact newly employed graduates have on the decision-making process in small and medium sized firms, Business Advantage's multi-lingual research team can provide the solution. Visit our [market research services](#) page for more information, or call David Eaton on +44(0)1689 873636.

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