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What we know about learning: How we must change the school experience.

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//About the author

Dr. Roger Schank was the Founder of the renowned Institute for the Learning Sciences at Northwestern University, where he is John P. Evans Professor Emeritus in Computer Science, Education and Psychology. He was Professor of computer science and psychology at Yale University and Director of the Yale Artificial Intelligence Project. He was a visiting professor at the University of Paris VII, an Assistant Professor of Computer Science and Linguistics at Stanford University and research fellow at the Institute for Semantics and Cognition in Switzerland. He also served as the Distinguished Career Professor in the School of Computer Science at Carnegie Mellon University. He is a fellow of the AAAI and was founder of the Cognitive Science Society and co-founder of the Journal of Cognitive Science. He holds a Ph.D. in linguistics from University of Texas.

In 1994, he founded Cognitive Arts Corporation, a company that designs and builds high quality multimedia simulations for use in corporate training and for online university-level courses. The latter were built in partnership with Columbia University.

In 2002 he founded Socratic Arts, a company that is devoted to making high quality e-learning affordable for both businesses and schools.

He is the author of more than 20 books on learning, language, artificial intelligence, education, memory, reading, e-learning, and story telling. The most recent are Virtual Learning, Coloring Outside the Lines: Raising a Smarter Kid by Breaking All the Rules, Scrooge meets Dick and Jane, Engines for Education, and Designing World Class E-Learning.

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As we learn more about learning, it still remains difficult to act in any important way. Although I am more concerned with K-12 than I am with universities, I am writing here about universities. Universities should be the easiest educational institutions to be changed. There are many good reasons to start there, but it is still more or less impossible to make a meaningful change in university education. Why?   A few reasons:

1. Universities insist on admission requirements

Text At first glance, fixing education does not seem like such a big issue fixing education, does it? Let me explain.

The fundamental assumption behind university admission requirements is part of what hinders all real change in education. Why are there admission requirements for top universities? Basically, there are three arguments for these requirements:

1. There is only so much space

This argument is sometimes actually true. You can always stuff a few more into a lecture hall, but dorm rooms are expensive to build, and seminars need to be kept small in order to make them work. But, of course, space is not an issue in an on-line curriculum, so surely this reason would not apply here. So, an on-line curriculum, the most likely venue for real change based on ideas from the learning sciences, would not have admission rules then, right?   Well, no.

When I worked with Carnegie-Mellon University to build their on-line curriculum in Computer Science, I proposed admitting anyone who applied. This idea was rejected because of argument number 2:

2. If everyone had a degree from an elite school, then it would no longer be an elite school, would it?

Well, maybe not. But why should that matter? A good

online university might give out thousands of degrees in a given field. The relevant question to ask would be: are the graduates of this program capable of doing something in the real world for which they have been trained at the school?

That is, of course, the real reason. Colleges do not typically train anyone to do anything real, so there is no way to judge. This is why you will never see Yale on-line. Yale would cease to be seen as "Yale" if suddenly there were hundreds of thousands of graduates. There is no way to judge if Yale graduates can do anything in the real world. That is not a measure that Yale uses. It was one I introduced in the CMU program I designed but the faculty was not quite ready for that new model.

And then there is the most commonly cited argument:

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3. It is difficult to teach students who are not well prepared

This argument says, in essence, that if it is hard to teach certain students, then they should not be taught. Professors do not think that they have the obligation to get students ready to learn whatever it is they think they should know. Instead, they insist that others prepare them and those that do not meet certain arbitrary objective measures not be let in.

Let us let everyone in. Let us design schools that have no space issues (one good reason for on-line schools.) Let us design schools that do not dwell on their elite name, ones that simply prepare people to do stuff. And, if students are not ready to learn what is taught at such schools, let us make sure we have a program that meets them where they are and gets them ready.

It can be done. "Anyone can go to a high quality university" is an important idea. A university that teaches real-world skills is an important idea. Space must cease to be an issue in order to enable the death of the elitism that stifles change. Students would need to understand that if they cannot do the work they will be left behind. This makes sense if the work is real.

2. Universities allow their faculty to determine the curriculum

Well, why not? The faculty are the experts. Would not they know what students who are studying in their field should learn?

This is indeed an interesting question and one that strikes at the very heart of what is wrong with today's universities. The average student goes to college intending to graduate and get a job in a field relevant to what he studied in school. This is what most students think will happen.

In any case, a professor who teaches the field that the student has decided to study has a number of problems with this pretty straightforward idea. The first problem the professor has with this idea is that he cannot relate to it. In general, professors have not actually worked in the real-world versions of the disciplines they profess. A computer science professor for example (this was my primary field when I was a professor) probably last wrote a computer program when he was a student in school. His specialty in computer science (mine was artificial intelligence) is what he wants to teach. Unfortunately, the average student does not need to learn this specialty and the professor really does not care about this. The professor wants to teach what he knows best, what he loves to think about, and what is the least work to him. So he makes up a dozen rationalizations about why his esoteric field is really so important for any computer science major to know.

Bear in mind that there are a lot of professors in any given department in any large university. Moreover, they each want to teach their own specialty, and very few of them have real-world experience. So, when all is said and done, the curriculum is a compromise of specialty subjects that surely are "very important for every student to know" which, when taken as a whole, will not even come close to getting a student started in his profession in the real world unless he wants to do research in that field which typically was not his original motivation.

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Think this is just true of computer science? I was also a psychology professor. Students in that field typically want to work in psychological services, health, counseling, social work and such. But, the professor's specialties are again driving what is required. So everyone has to take cognitive psychology (my specialty in psychology) even if no way will it help them counsel people. Well, it might help them. How could it hurt them? Such reasoning is a cover-up for the fact that many psychology departments do not have a faculty at all in clinical psychology because they do not consider it to be an academic subject. There is no idea whatsoever, in most departments, of enabling students to be pre-clinical. They typically refuse to teach such practical subjects -- often because they really do not know all that much about them.

Developmental psychology, for example, a subject that teaches about how children develop, is often filled with students who want to know about the children they expect to have some day. Will their professors accommodate them? Their professors do not necessarily know much about child raising. What they do know about is how to do research in developmental psychology. They know how to conduct research and feel that they should therefore teach students to conduct research even though their students have no intention whatsoever of ever doing research in life.

Remember those introductory courses you took in psychology? Did not they seem dull? A mindless survey of everything anyone ever thought in psychology. There was no way to get out of them if you wanted to study anything else in psychology. Why was that the case? In any research university, the psychology faculty needs subjects to do experiments with. They get them from the introductory course. So, all of the students are funneled into that course in order to provide fodder to the experimental mill going in the laboratories next door.

This is why you cannot trust faculty to teach anyone who is not preparing to be exactly the kind of professional that they are – namely, a researcher in a particular specialty within a given field? Professors are enamored with theories and ideas precisely because this is what they deal with all day. If you want practical real-world skills, you will not learn them from them. But why should this be the case? Why should not an undergraduate with no intention of becoming a researcher be unable to pursue a more pragmatic education?

This is simple to explain. Practitioners are looked down upon by researchers. Professors at top universities do not want to think they are training practitioners. That is just training and they do not like it. They rationalize the irrelevant education they provide by saying it is about ideas and that they are teaching you to think. This is a wonderful rationalization that allows them to keep on teaching their own specialties and then be able to quickly go back to doing their research. Lesser universities desperately want to be like the more important ones, so even when their professors are not themselves researchers, they aspire to be like the heroes of their field. So, they teach the same courses they took when they were getting their Ph.D. It does not get any better at universities that do not emphasize over research.

In general, students' and their real-world's needs and expectations are ignored by the faculty. Someone other than faculty needs to determine their course of study. Professors have proven that they do not really care about this issue over and over again.

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All this is happening in any of the universities that exists today but would not happen at a well-planned on-line university. Why not? Because a well-planned online university would seek advice about what to teach from professionals who did not have a vested interest in the answer. In other words, no on-line university would have to employ a permanent faculty, so there would be no one to press their own special needs. This way, students' needs could actually be served by professionals whose only interest was making sure that students were well educated in their chosen field.

3. Courses have fixed time lengths and are taken in parallel

The crux of the issue in teaching students is whether teaching them entails making them memorize information in order to pass tests, or whether it entails creating experiences for students from which they can learn through participation.

Since students typically take courses when they are in school, let us turn this issue around. How long should a course last?

The university's answer: fourteen weeks (plus or minus a few weeks.)

And how often should a course meet?

The university's answer: three hours a week (more or less.)

One would be right in assuming then that a course should, for a given reason, always be about 42 hours long. I wonder how that number was arrived at and how the fact that all courses are exactly the same length happens.

Do you think the answer might have anything to do with the needs of students? Or might it be more reasonable to assume that it has to do with the needs of the faculty?

When I was a professor at Northwestern University, I was expected to teach one course every two years. The course lasted 12 weeks and met for three hours a week. I was lured to Northwestern, in part by this better deal. At Yale I had to teach one course every year (and it lasted sixteen weeks!)

The more important you are the less you teach. Teaching, for professors at the top universities, is considered a burden that one is always trying to get out of. Bad professors (the ones that do not publish or bring in research funds for example) are punished with more teaching.

Given that what I am describing is quite normal at top universities, ask yourself why courses are structured the way they are. Whose interests are served by fixed course lengths and minimal course hours per week? You might think that having a student take four or five courses in a semester that are unrelated to each other serves the interests of the student's breadth and choice. But its actual purpose is not to let professors' teaching get in the way of more important matters. If courses are only going to meet three hours a week, then students will need to take

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lots of them to keep occupied. The fact that this sometimes causes students not to be able to focus at all on some of their courses does not bother the faculty.

Courses that are structured in this way do not really allow instruction that is anything other than lecture and test. Designing real experiences for students, ones that allow them to thoroughly investigate something, or build something, or design something, would take more than 42 hours and would require students to focus on only one or two courses at a time. This in turn would require professors to be available to help students whenever they needed help in pursuing whatever project they were involved in. So, while an intensive course might be good for students by letting them get really involved in something, it would be bad for professors since it would not allow them to consider teaching the least important aspect of their job.

How long should a course take? As long as it takes to learn whatever it is the student is trying to learn how to do. But, how would that work exactly? Students would have to be given the freedom to pursue a project in the right time period for them (and for the project). This would mean that professors would have a lifestyle that was very unstructured, an unacceptable state of affairs for someone who has more important items on his agenda.

Courses, as they exist today, probably should not exist at all. They exist to make life easy for the faculty. Real teaching would require real experiences. Mentoring those experiences should be what the faculty do. It would be what the faculty would do in a well-designed on-line university. This kind of apprenticeship-type teaching only happens at the end of Ph.D. programs in today's universities. Professors get serious about PhD students. Perhaps they should get serious about everyone else.

4. Teaching does not occur just in time

In an on-line, learning by doing, experience-based learning environment, teaching occurs on an as-needed basis. Need help in what you are doing? Ask for it. Available to help: mentors, other students, and the faculty. Teaching in an as-needed environment is not all that difficult really, especially since those at the faculty who do it do not have to lecture, meet classes, or grade tests. We did this in the on-line master programs we designed at Carnegie Mellon West and it is working just fine. The CMU West model should be the model for on-line universities for years to come.

Who should teach? Whoever is capable of mentoring a student through a particular issue? The idea of one teacher/one course is a classroom-based idea. In an on-line curriculum there can be math mentors, physics mentors, computer mentors, writing mentors and teamwork mentors all available as part of the same course (in a story that involved all of the above issues.)

The idea that the experts who teach must be Ph.D.s who are top ranked researchers makes little sense in a project-oriented environment. While building a web site as part of a project on medical information, for example, the best mentor might be a professional web site builder rather than the medical school staff.

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5. Courses are dominated by lectures not projects

Many professors have recognized the value of project-based learning and it is not unusual to find this type of course in a university. One is more likely to encounter such courses in engineering, computer science or journalism. In other words, projects work well in courses where the end result is a student who has learned to actually do something.   This should be true of all fields not just ones that are obviously about doing.

But more important is the placement of those projects in the curriculum. Typically one finds the project course at the end of a curriculum – perhaps in the senior year in college. Why is that so?

This again comes down to curriculum committees that have determined that one must know this or that before embarking on any real-world experience. They are interested, as I said, in filling seats in introductory courses. If they let people do project courses first, it would not be possible to make the economics of the department work. Project courses are expensive to run. You have to have a small student teacher ratio to make them work. The 500-1 ratio that works so well (in terms of money to a department) in a lecture course is replaced by 20-1 or worse, 10-1. The faculty gets paid the same one way or the other, so departments hate this. Never mind that, at least since Plato, scholars have been pointing out that we really only learn by doing. Students know this too which is why they all prefer project course to lecture courses. (That is, those who want to learn do prefer them.)

Starting with a project makes a lot more sense in terms of deciding whether you like a field as well. Listening to someone talk about a field tells you much less than actually trying to do work in that field will ever teach you. Universities encourage summer internships for this sort of thing. Or, to put it differently, they leave the real teaching to companies that students can get to take them on for free. Unfortunately, the teaching there is hit or miss since the people in that company are unlikely to be teachers or care much about teaching.

Starting with projects, and continuing with projects -- ones that relate one to the other would be nice -works best for students, but the economics of the university prevent that. Once again, the on-line university can take care of this issue quite effectively. The reason: just in time teaching is required for project-based learning and just in time teaching works exceedingly well in an on-line environment. Teachers can be available on demand in an on-line environment and suddenly the numbers start to work.

6. Success in school is still a competitive event

There is someone who works for me who is a graduate of a very respectable academic institution. I often need him to write things, but I keep having to remind myself not to ask him because he simply cannot write a coherent English sentence. The other day I asked him how it was possible that he could be a graduate of this esteemed institution and yet not be able to write at all. He responded that he was a math major in college and that he had chosen this field precisely because there would be no papers to write. He knew he could not write. He therefore

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avoided writing courses. Now this may seem, and of course it is, the exact opposite of what college is supposed to be about. Should not one focus on what is hard and learn that? How naïve!

This man was on a scholarship. He did not want to do anything to jeopardize the scholarship and that would include taking a course that might result in a bad grade. I remember a friend of my son who majored in psychology because it was full of multiple choice tests and he said he was very good at those tests. What a reason to study something! I also remember a French kid in one of my French classes when I was in college. When I asked him what he was doing there, he said it was an easy "A".

As long as education produces winners and losers we will not be able to make meaningful change. As long as school is viewed as a competition, we will have players of the game who are good at the game but learn very little. Real change in education requires more than research in education. There is a battle to be waged out there. The answer is using the notion of a story-centered curriculum.

The Story-Centered Curriculum

In contrast to the typical subject-oriented curriculum, a Story-Centered Curriculum (SCC) can be viewed as a carefully designed apprenticeship-style learning experience in which the student encounters a planned sequence of real-world situations constructed to motivate the development and application of knowledge and skills in an integrated fashion. A realistic story, at the core of each SCC, provides a meaningful, motivating role for the student, designed to ensure that the student faces exactly the right progression of challenges to build and stretch his or her abilities. While the "characters" that a student encounters in a traditional apprenticeship are primarily concerned with their own-life goals, the characters in a Story-Centered Curriculum are specifically constructed to further the student's education by providing appropriate challenges. Mentors play the expert role, providing one-on-one coaching, help, and feedback to the student, while encouraging self-directed learning. Through such mechanisms, the SCC provides accelerated experiential learning.

Although realistic projects are crucial to a successful SCC, a curriculum is not just a random collection of projects. Rather, it is a carefully crafted sequence in which each project builds on and extends the knowledge and skills of previous projects, while remaining in the same overarching story context. This progression of projects is the heart of any SCC. A rich and realistic context promotes the acquisition of knowledge to be used, while extended interaction within a single story leverages the story context, reducing the need for "non-added-value learning" that is unrelated to targeted knowledge and skills (e.g. learning the particulars of a fictional client company).

Because real-world problems are often large, multifaceted and complex, students in a SCC are taught to work through huge challenges in a principled and incremental way, systematically building on previously-acquired skills and knowledge. This helps students understand how to break down problems into manageable sub-problems, put together a sensible work plan for

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accomplishing all the tasks required, and not be daunted when facing similarly large problems in the world around them.

The normal high school situation pits individual students in competition with one another for grades, and only rarely does it team students in a serious way. The SCC often teams students because their underlying stories require multiple roles, and because learning to work as a team— and, perhaps, even as a virtually-distributed team—is an important aspect of many modern-world careers. The team-based nature of many SCC projects means that students can learn from each other, and it also means that students must learn additional skills, such as dividing work equitably and dealing with relationships and working-style issues.

SCCs are not inherently computer-based, and much of the activity that students perform as they complete an SCC typically takes place offline. This can include meeting with teammates, researching a local issue, building a robot and drawing an architectural sketch, depending on the particular story that the student is participating in. However, the computer is typically used to deliver a SCC. Students enrolled in a curriculum are typically "employed" by a fictional organization (such as the webzine company, or the robotics company, again, depending on the story), and each project is typically laid out for the student in the form of a simulated web-delivered email from a fictional manager or other superior in the organization. The email explains what needs to be done, and other pages on the website provide help with how to proceed, including tips and traps, pointers about books that may be helpful, and so forth. In addition, if the student is getting help from a distant mentor supplied by us, then they will use the site to find out how to ask the mentor questions, and how to submit deliverables to the mentor for evaluation and feedback.

A SCC drastically alters the place of instruction in the curriculum. Whereas instructors are center-stage in the traditional curriculum, the SCC places the student and his or her role within the story at center stage. Instruction is relegated to a reduced but still important support role, providing help, advice and feedback just in time as the student continues to work. We use the word "mentor" rather than "instructor" to highlight the changed role of the teacher.

The SCC calls for two types of mentors: learning coaches and subject-matter experts. A learning coach will motivate and channel the student into productive directions, helping the student to formulate strategies for assigned tasks and to identify opportunities for self-directed learning during the performance of a task.

We have already built numerous on-line learn-by-doing education offerings. We have done this on both the K-12 level and the university level, as well as for numerous major corporations.

In early 2002 we created a new type of master's program for Carnegie Mellon's new West Coast Campus in Mountain View, California. The program replaced traditional lectures with project-based learning by SCC. Students work in teams on realistic projects with authentic deliverables, receive coaching from the faculty and mentors, and have the opportunity to experience in simulation the realities of a career they might pursue upon graduation.

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The programs are identical whether students take them on campus or on-line, the only difference being whether they collaborate with their teammates and mentors in person or via the Web or phone. Each student team consists of around five or six students. The teams set their own meeting times and schedule their own sessions with mentors. This way, the students have maximum flexibility and find that they can more easily balance their schoolwork with other commitments they may have.

These masters' degrees have been offered by Carnegie Mellon for more than eight years now. The response by students has been very positive, they are clamoring to be admitted.

We have now begun the great experiment by creating an alternative that challenges existing high schools. This alternative, the first of which we have named the Virtual International Science and Technology Academy (VISTA), consists of one curriculum per year. At the time of writing this, we have completed one half of a year—a curriculum in Health Sciences. In this curriculum, students work in a fictional nutrition clinic, sports medicine clinic, and organ bank, among other challenging environments, dealing with biological issues, medical diagnosis, ethical issues, basic scientific reasoning, and so on. In February this year, we began to test a segment of the Health Sciences curriculum, Superworm, which is a one-week intensive experience in attempting to re-design the common earthworm in order to improve its role in agriculture and make better crop-yields. Obviously, such issues are new to high-school-age students and they must learn a great deal about new subjects if they are to produce the required deliverable. Students present their theories on what kind of changes could actually be made to an earthworm that would be helpful to agriculture without killing the worm. They propose hypotheses to mentors along the way and get help in making choices.

Our tests were a great success. Most students love the experience. Those who do not like it complain that it is too much work and that it is much easier to sit quietly and pass tests.

La Salle, Barcelona

About two years ago I met Ramón Ollé, who had recently retired as CEO of Epson Europe and suddenly found himself in charge of the Business Engineering School at La Salle University, in Barcelona. During his years at Epson he had hired many graduates from that college and others, and believed that the training they received there was highly theoretical, not practical enough, nor oriented to the real world of business. It was clear to him that students needed a different kind of training in order to prepare them for professional life. He began to talk to the faculty about teaching different kinds of courses, ones that were less theoretical and more related to what people actually do in business. Of course, the faculty objected.

Ramón and I had dinner and discussed what we could do together. I said we could build any program he wanted on-line as long as we did not need the approval of the faculty to do it and had good experts available. He said he was the expert and we needed the approval of no one. I said it would be expensive and he told me: God would provide.

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Two months later I found myself in front of 25 faculties in Barcelona as I interviewed the president about what people would have to know, how to do it in order to make them into people he would hire. He gave me a list. The faculty did get to comment, but that was about it. It was clear who was in charge.

So, to build a story-centered curriculum meant to teach practical business by creating simulated experiences. It will be delivered on-line around the world, using mentors who speak the student's language. (The web site is in English.) No classes. No lectures. No tests. We are calling it an experiential MBA. The idea is to help the graduates launch their own business or go to work.

Students are part of teams that work to create deliverables within a story about a situation that demands some work on their part. They consult with their team members and use extensive background, and step by step help with what has been created as part of the web site. Mentors are available to answer questions and to evaluate the final work product. The projects are large enough for students to need to divide up the work and consult with each other on how to proceed. Eventually they create a deliverable and either continue to work on improving it after receiving feedback from the mentor or move on to the next subtask in the story.

Here are the projects that comprise this full-year all-day-long every-day program:

Course 1: Cash Crisis

Analyze and Solve Financial Business Problems

Students, working in the role of financial consultants, help a family-owned winery resolve a cash flow crisis that is preventing them from renewing a much needed bank loan. Students initially conduct financial analyses to identify problems within the business; then they conduct a root cause analysis to determine the underlying causes of the problems. They develop an action plan for the business, including five-year financial projections, which they provide to the bank as evidence of the winery's future financial health.

Course 2: Going On-line

Take a Small Business On-line

An investor contacts the students explaining she is interested in opening an on-line business that sells gift baskets, and that she would like their help in getting it started. Having already done some basic analysis, which showed that generally gift baskets are profitable, she chooses to leave it up to the students to decide what kind of gift basket business to design. At this stage, the investor is more interested at this stage in ensuring the website's user interface will have a welcoming look and good functionality to make sure it will impress prospective buyers.

Students begin by interviewing prospective customers to learn how they typically buy such items on-line, studying their usage patterns, and identifying common breakdowns in the usual process. Next, students produce expected user scenarios for the various "personas" that represent prospective users of the site. They then define functional and non-functional requirements for the site, and design the information architecture, including content, sitemap, wireframes, and low-

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fidelity prototypes. They test their prototypes on prospective users, and finally select a vendor to build the site.

Course 2a: HTML

As a parallel project that students begin in the middle of Course 2, students are hired as web page authors for PteraLogic, an independent software consulting firm where they are asked to develop a website for Moffett Foods, that currently lacks a web presence. Students begin by developing a first "Who We Are" web page that provides an overview of Moffett Foods. They then develop a page listing the products Moffett Foods sells, incorporating logos and other corporate images to make the site more visually interesting and appealing. Students continue to progressively develop more complex information and graphical/technical elements into the Moffett Foods website, including, e.g.:

- An employment page with embedded anchors and links to make the site more easily navigable, including a "contact us" link that enables easy email communication with a click on the site page

- Elements of style, working with fonts (size and color), margins, alignment, background color, etc. to provide their client with different options for the look of the site

- Bulleted or numbered lists, including new pricing information, for a cleaner organization of information

- A standard set of links to enable users to browse from any page to any page without first going through the homepage

- A form with fields for site visitors to provide personal contact information to Moffett

- Glitzier design, including more advanced cascading style-sheets, including animation and other tricks of the trade

- Ensure the site will work on multiple common browser types

Course 3: Marketing a Product Launch

Students work as members of a product launch team whose goal is to launch a new social network for amateur performers, called iSing.com. Students first select a role: product marketing or marketing communication. They work in teams of four, including two product marketing and two marketing communication team members, and prepare a launching plan for this product.

The students develop a message architecture and a preliminary market segmentation for the product; identify the target market through demographics and psychographics; and plan a launching program that includes:

- Specifying total product requirements

- Determining barriers to adoption

- Competitive analysis

- Market/customer research

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- Selecting a PR firm

- Market leverage tactics

- Communication plan

- Selecting appropriate web tools

- Branding

- Market research

Finally, students prepare a budget to support the planned activities. They present and defend their plan and budget requirements to the top management of the company.

Course 4: Supply Chain Reaction

Reengineering a Supply Chain

Students work as supply chain consultants helping RightByte Technologies plan a modified supply chain process to suit a new line of products the company intends to sell. They receive a report from RightByte's Supply Chain Director describing the current process and its main problems. With this information, the students determine the root causes of the problems and recommend solutions, balancing the industry's best practices with the company's specific needs, and make their recommendations. Students examine the following supply chain components: supply-demand planning, transportation, warehouse management, sales order management, and central order fulfillment.   In evaluating potential solutions, students consider each solution's potential impact on customer service, potential cost savings, and potential ease/difficulty of implementation.

Course 5: Investment Readiness

Developing a business plan for a tech company's international expansion

Next.TV is a small company that has been successful in the local market in Ireland. It has developed a software package to automate an editorial department of a television channel. Most of the main domestic channels have already implemented the package, and now the company wants to go international.

Students are hired as expert consultants to prepare the company for this second financing round and to present the project to venture capitalists. Students begin with an analysis of the financial health of the company, examining the profit and loss statement and balance sheet. They then enhance the product value proposition; prepare a five-year international sales plan and roll out the plan; prepare a budget for marketing and headquarters; determine the company's financial

needs and its value; they then write a business plan, and negotiate details of venture capitalists' offers.

Course 6: Ethical Governance and Change Management: The Story of a 21st Century Business

Students immerse themselves in a novel (written especially for this MBA program) about an international pharmaceutical company engaged in a hostile takeover of a smaller, but highly successful competitor. Students witness the tough negotiations, the elimination of dedicated and talented individuals, and the painful shuffling of roles and responsibilities that accompany a major change in a modern corporation. Students also confront the complicated (and sometimes conflicting) relationship between social responsibility, legal responsibility, and profit motive, as they witness the company's attempt to establish a new research facility in a blighted town as a consequence of the merger.

As students consider each chapter, they critique the actions and reactions of the central characters, come up with advise for ulterior steps, and glean lessons related to negotiation, change management, legal and ethical issues in corporate governance, and working with other cultures.

Course 7: Selling and Implementing Solutions

Students begin their work as new project managers at a premier event-planning company, World Class Events. Students begin by qualifying and prioritizing opportunities to propose work to prospective clients, pitching to senior management which of the proposals should receive the greatest budget, based on potential profitability, likelihood of winning, and other relevant considerations. Students learn they will be proposing work for an automotive event entailing a multi-city caravan, as well as a showcasing and test drive event for electric cars. Students create a project scope document for the sales effort, first planning and attending a simulated meeting with event-planning experts to determine a vision for the event, including risks and open questions for the client. They then engage in a role-play call with the client, introducing World Class Events and clarifying the project vision. Students then go through key elements of the sales and project management process, such as:

- Developing, communicating, and then tracking progress down on a task list and then project plan and budget for the sales initiative

- Engaging in project reviews and developing status reports

- Developing the project schedule, budget, risk management plan

- Producing the proposal for the client

- Developing and presenting to the client a sales pitch for World Class Events and the proposal for the project

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- Preparing and negotiating the statement of work

- Resolving project issues during the engagement execution phase

- Closing the project

Only by making profound changes in the very nature of what it feels like to be in school can we enable students to learn from experience rather than to be instructed by teachers. Learning means learning how to do it.

\<Suggested bibliography\>

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