

Interview with Award Winning Professor, Dr. Vivekanandan S. Kumar

Marie: You have won a variety of awards and taken on some prestigious roles. What are some of your most monumental awards, positions, and acclamations?

Dr. Kumar: My very first award was a United Nations fellowship. I was working in India at the time as a Scientist. I was asked to select any university of my choice, anywhere in the world, study the technologies explored in that particular university, within a particular project, and then bring those ideas back. I chose the Learning Research and Development Center at the University of Pittsburgh, in Pittsburgh, PA, USA. The center was very popular in those days, the early 90s. They were exploring some dazzling techniques to engage students, help students at the most opportune moments, to measure trainees' skills, to predict trainee success, etcetera. During the tenure of this fellowship, I worked closely with some of the leading researchers in learning technologies, and it was a fulfilling experience for me. That experience bootstrapped where I am today. That experience switched me from being a pure technologist to someone you can call an education-inclined technologist.

My second award was from the Asian Development Bank. While at the Simon Fraser University as an Assistant Professor, a team of us won a considerably large funding to go to Sri Lanka and assist the Open University of Sri Lanka advance its internet infrastructure as well as their educational technology infrastructure. Our team spent about three years in Sri Lanka, in Colombo and also in other ethnically affected places in the country, to deploy an infrastructure for online learning. That was a very rewarding experience to personally see the Canadian advantage in educational technology and what Canada could offer the rest of the world.

Marie: You have published a book. Please describe the scope and nature of your book publication.

Dr. Kumar: That book I now have under my belt is an edited book, with Dr Fuhua Lin as the co-editor. It was based on contributions to the International Journal of Distance Education and Technologies. I reviewed and selected about twenty articles, sequenced them for a meaningful read, and wrote a 12 page preface for the book. It was time consuming work. It gave me the opportunity to see the mindset of people looking into educational technology from different perspectives - culturally, technologically, and pedagogically.

Presently, I am writing a book titled 'Learning Analytics for You'. This is a Springer book, and it is expected to be out in the market by the end of this year. This is not just a book. This is something that would build a learning analytics community. It aims primarily at teachers to enable them integrate learning analytics solutions in their classrooms and connect with others who are also investigating analytics techniques.

Marie: You teach courses ranging from business to computer science. Please fill us in on the range of courses you have taught or designed at Athabasca.

Dr. Kumar: In computing, I have designed, developed, and taught courses in pretty much every level, 200, 300, 400, 500, and 600, including some of the high enrolment introductory courses such as the

Introduction to Programming in Java to technical courses such as Computer Networks and Artificial Intelligence, to advanced courses such as Learning Analytics, Business Intelligence, and Research Methods.

Marie: As an instructor in online education, what are some of the challenges as well as some of the highlights of teaching online?

Dr. Kumar: Let me first look at challenges. The foremost challenge as a teacher is connecting meaningfully with students. I have taught in traditional universities where, outside of the classroom, students could freely approach me or come to my office or set up an appointment or have a cup of coffee and talk about things. There were so many informal opportunities for students to engage in intellectually challenging conversations, and I felt so happy doing that since it complemented the in-class experience. It also established some sort of a connection with my students: intellectually, emotionally, and even spiritually. Those are the things I miss here. Online learning should catch up to these sort of connections. We are not there yet.

You know, Athabasca offers so many ways to connect with students. Students can initiate a chat from within the online course itself and that chat message would come to the professor in the form of an email or the students can directly send emails. AU now has student success centre as an option. Students can also connect using phones. Some students prefer to connect with me over Skype. Some prefer connecting via social media such as Facebook® or AU's own Landing. My calendar is open to my students and they are welcome to set up non-overlapping appointments for Skype meetings.

Grad students prefer real time conversation, and we typically use video conferencing tools. Seemingly we have a diverse range of tools to enrich student-teacher communications. The diversity itself is a challenge for the teacher, I should say. For example, I am very comfortable and I feel that I could do my best when I am in a synchronous communication with my students. That makes me feel confident about finding the right teachable moment. With asynchronous channels, such as email, I always have this question hanging over my head as to whether I really covered the full scope of my students' questions. I have to wait until the student responds to confirm. Those are the gaps and challenges.

Some of these channels are not really good, at least for me personally. Faculty members do have their own favourite channels of communication. That is a challenge for students taking multiple courses where they have to switch among multiple channels of communications, even use those that they do not favour.

As for the highlights, one of the reasons I am here as an online teacher is that I absolutely believe this is the next generation of learning, the next leaf in the evolutionary tree of education. This is why I am putting all of my effort in learning analytics research. Until now, whatever we had done in instruction and learning, has a significantly big hole in our understanding of where students currently are at any given time of study and where the student needs to be, every step of the way, down the road. With analytics, we have the ability to allow students to track their own study habits, their own gaps in knowledge, and their own opportunities for learnable moments, which allows us teachers to fill in the gaps and address them right away. We don't have to wait for the assessments to come in to let us know

where students need support. We can do that on a minute-by-minute basis with current technologies that can estimate their competence in each subject domain at various levels of granularity. In that sense, we are leaping into the next generation of education, and we are looking into the next generation of skill sets students need to succeed.

Regulation is something I strongly believe in. We know that students who regulate perform better. How do we bring that skill, the skill to regulate one's own study, as an integral part of a coursework? That is something we can do in an online world, quite comfortably. Online university does offer self-paced and highly contextual instruction, and offers better opportunity for pedagogical intervention. That is okay, but the most important piece is our ability to assist students to regulate their own study affairs on top of other perspectives offered by the online learning courses.

Opportunities are plenty in the online world to regulate someone's study habits, and with the upcoming learning analytics mechanisms, I think Athabasca is set up to be a leader, to show the world, how well we can cater to the intellectual needs of our students, not just at the subject matter competence but also at the metacognition-oriented soft skills. This is something I really want to push toward.

Marie: Can you please tell us a bit more about your spiritual connections with students?

Dr. Kumar: Understanding native cultures from around the world is one of my favourite quests. I use the word culture quite loosely because to understand culture you also have to understand various interests and belief systems, including religion, community and spirituality. These are the contexts many students bring with them as they engage in conversations with me. Identifying culturally with students has reaped enormous rewards for me. My exposure to many cultures from around the world makes students feel better about talking about those issues with me, I guess. It has opened doors to understand the needs of my students that otherwise would not have been possible. It always amazes me to see how well people connect with their spiritualism and how well it motivates them to become better contributors to knowledge creation.

Marie: How do you aim to stimulate student motivation in online learning environments?

Dr. Kumar: I think I partially answered that [in part I of the interviews with me]. Convincing students that they are pioneers in this next generation of learning is a major stimulus for student motivation. Studying in an online university is much harder than studying in a traditional university because of the level of commitment, the need for concentration, the ability to self-regulate, and the capacity to execute initiatives expected of students. The skillsets gained by students and the confidence with which they can apply these skillsets are keys not only to the success of our students but also to AU's reputation. We need to make students believe that they are pioneers that the rest of the world is going to follow. Students should remember that the blended and supplemental online instruction now offered at traditional universities have been adopted, nurtured, and promoted by Athabasca University decades ahead of time. We strive to be in the forefront of things when it comes to learning innovation and students should feel that they are not only part of this innovation but also drive the innovation.

There are innovative techniques that would help students showcase their successes and challenges. Suppose a student has completed one year of study at Athabasca University. The student can get a good transcript to show for that effort. How about offering students an electronic profile that is automatically generated, capturing every experience the student has had over that year? This study experience would include measurable indicators such as the ability of the student to assist peers in subject matters, the conceptual excellence of the student, the study challenges faced by the student, the tenacity of the student in facing those challenges, gaps in skills of the student, the growth of different competences in various subject areas, and the translations of these skillsets into outcomes expected by targeted markets, where students seek jobs or business opportunities or other intellectual pursuits, all captured, categorized, and measured over the last 365 days. That would be a wonderful motivator to make AU students stand out. Imagine publishing, preferably anonymously, this kind of profiles of all our students, on a weekly or even a daily basis. That is the kind of opportunity and advancement we are looking to provide to our students, as part of the AU experience. With Analytics.

That is what is now possible with our research efforts in analytics that we are currently testing in pilot projects, hoping to bring it to reality shortly. It offers students not just a transcript, not just their grades, of course they are important, but also how exactly they achieved those grades, with study pathways and evidences of excellence backing the grades. How is that for motivation? Our students should feel the excitement with initiatives such as this one to be proud of being at Athabasca University and studying online. They certainly are the primary drivers behind such innovations.

Online learning implies access to knowledge through instructional modes that accommodate student's pace, capacity, and aspirations. We could easily supplement online material with contemporary expert instruction and interaction. We should be able to tap into expertise and bring it to our students whenever and wherever they are available as multiple streams of instruction that students can choose from. That is the level of engagement opportunities we can offer our students, as yet another stimulus of motivation.

Our students should feel that they are creating knowledge as they study. That is the prime reason of being in a university – knowledge creation. This is something I really really want to push. Knowledge creation transcends the location of study. Educational institutions simply offer environments for knowledge creation. Students, instructors, and administrators, we all need to see that, as a university, our mandate is to support students and help them become an integral part of the knowledge creation process. Getting this message out is another key driver for student motivation.

Marie: What is your approach to providing feedback for students to help them with their learning objectives?

Dr. Kumar: Feedback typically is aimed at helping students to understand things. As a precursor, students should be able to approach the instructor without any hesitation. I tend to be open with students, make them feel welcome to contact me as they see fit, through any of the means available, at any time. Students should feel that this person is actually valuable to have a conversation with. It comes back to relationship establishment. By being open and by being approachable, we are building a healthy

channel for our students to feel good about contacting instructors. The quality of feedback could vary from person to person, based mostly on the pedagogical philosophies of the instructor.

Personally, I tend to match the context of my feedback to the feedback expectations of students. This approach has worked well for me till now. In fact, this closely relates to one of the research questions of my doctoral dissertation.

Marie: What do you purport to be the role of technology and multimedia in online environments? How do they aid or complicate online learning?

Dr. Kumar: More important than teaching students about concepts is our ability to guide students to learn the concepts, effectively, to a deeper extent. In other words, how to teach students to enable them study themselves effectively and how to measure their study efforts regularly? This is what we can do in a technology-savvy multiple-media online environment.

I can always go in front of the students and give a three hour lecture. Then, I can give them another one hour lecture to tell them how to understand and effectively study the material covered in that 3-hour lecture. This additional instruction is typically not present in traditional instruction, and that is what we can comfortably include in an online environment with technology and media. Further, with technology and media, we can customize the regular and additional instruction to the needs of individual students.

I am not talking about babysitting or spoon feeding our students. I am talking about scaffolding our students so that they can build themselves to exceed their own expectations and the expectations of the university. I can help my students feel like an integral component of knowledge creation, in a technology infused world, where they take ownership of the knowledge they create. Technology is now an integral part of human life. About twenty five years ago, we were still questioning the need for technology in social life. Now that the technology is here to stay, we strive to customize technology to optimize the benefits. I think that's what we are preparing out students for, to make sense and groom technology and media.

Media typically combines the information being conveyed and the channel that carries the information. How exactly does the intertwining of information with the channel benefit our students? Is the channel good enough for the type of information it carries? Is the information valuable enough to share across multiple channels? Is it possible to feel the emotion expressed in the channel? The possibilities are endless.

How exactly to customize the media to get a higher level of enthusiastic interaction? It is not just a technology problem. It is a human problem. We need to do more research in customizing media to get the meaning of what is being conveyed and how well it is conveyed. It is a good research challenge for us. Imagine a study session where we collect recordings of your facial expression, your body movements, your contemplation of the problem, your communication with friends and the study group, and so on. One of my research assistants is looking for ways to integrate these pieces of information to build a model of what we call a sentimental mental makeup. The mental makeup will allow us, for instance, to understand and explain the negative student experiences or positive student insights.

Another research assistant is looking to accurately measure and causally associate ADHD affliction. Technology allows us to support students who need different kinds of media to learn effectively. Gioia is yet another research project that targets conversational analytics, to understand and measure the social distance between people engaged in conversations. The website <http://LearningAnalytics.ca> highlights some of our learning analytics projects.

Marie: What is your particular philosophy on student evaluation?

Dr. Kumar: Evaluation should be continuous. Evaluation should estimate competences of the student based on all observable learning experiences, not just based on observations of student's assessments. Continuous observations of the student's study habits and translations of these observations into competences could provide substantiation for the performances of the student in formal assessments.

Continuous assessment also allows instructors to react as and when a student's need is identified, not after a formal evaluation is completed.

Data on continuous assessment is also open to students, allowing them to reflect on their own understanding and to proactively seek help when they need it.

Continuous assessment also paves way for institutions to compare the quality of their offerings and align their respective instructional methods towards a more optimal method based on observed evidences of students' performances.

Finally, continuous assessment generates a take-home profile of a student's capacity to study and ability to learn – metacognitive traits that normally are neither measured nor groomed.

Loads of goodness with continuous assessments.

Marie: What pedagogical standpoint is most reflective of your way of teaching?

Dr. Kumar: I preach analytics. "My Dear Students, this is what you are studying. Continually record what you study, how you study, reflect on it, regulate on it, and strategize your study, so you can see where you are headed". Analytics applies to me as well as a teacher. I need to continually record how I teach, how I approach students, how I maintain my teaching philosophies, and how I help students become better researchers and better learners. Whatever I have taught in the last seven years at AU, I should have had a recording of it, I should be able to analyze it, find out what was effective and what was not effective, figure out a more effective way to adapt my teaching to suit different student needs, and make changes to my teaching habits. That is something I really strive to do--what I call teaching analytics. I think that's what every teacher should do. Such a regulatory teaching practice will bring the inherent pedagogy explicit.

Here is what I wrote in pedagogy in a recent article – "Pedagogy is about formulating and deploying a theory of effectiveness of learning in a given context. Over the last three decades, pedagogy in computer-based learning has undergone a gradual transition from being fully implicit to being modestly explicit. I believe we should strive to make pedagogy fully open. Pedagogical attributes such as the

context of instruction, target learner traits, learning goals and principles, instructional methods, study session constraints, and the connectivity among these attributes should be made explicit. Doing so will allow one to question not only the value and relevance of the pedagogy used in instruction but also validate its internal structure, allowing for the extraction of valuable pedagogical insights.” This is my pedagogical standpoint.

Marie: What technological shifts would you like to see online education take in the future?

Dr. Kumar: Well, my core research is about learning analytics. As a by-product, I expect to produce a causal model based on observed data and inferred insights. Let's say that we are able to observe every study-related activity that a student had performed for one full month in any given course. At the end of my thirty day observation, first of all, is it possible for me to list all of the skills exhibited by the student, translate these skills into standardized competences, match competences with expected learning outcomes, and allow the student to adapt his/her own study habits towards optimal learning efficiency? That is the kind of technological shift I'd like to see in online education, where computers are used not just as dumb terminals vomiting data and information but also smart enough to understand the student needs and do something about these needs. That exactly is my research focus, if you can find it from my web page <http://vivek.athabasca.ca>. It says “Imagine a software agent that calls your computer its home, helps you to study better, be your friend, and motivates you to act in your long-term best interest, consistent with your own deepest values, personal, social, and other standards.” (thanks to my student Ireti who helped me shape up this statement).

The teacher plays a part but only as a human-in-the-loop, a guide on the side, fully integrating the pedagogy within such software agents, as in directing a movie with hundreds of minions.

Experiments on learning analytics are being planned in institutions around the world, and of course at AU. Learning analytics is going to take on the future of allowing students to feel their own study experiences and to prod them towards better learning. Imagine the same information being made available to, say, teachers or parents or politicians or the general public – of course, anonymously, when needed, to see what had happened in the students' study life in the last so many days, what efforts are being made to make their study life more effective and more joyful. That is a piece of beauty. That is the sort of technological shift we should strive for.

Technology is shifting more and more toward analytics, and we are pioneering that direction at Athabasca University.

Marie: Can you tell us a little bit more about analytics, Doctor Kumar?

Dr. Kumar: Analytics is all about insights. Learning Analytics is the study of detection, analysis, and generation of moments of insights about learning experiences.

Let's say the student read something this morning in an e-textbook. We can look at the speed with which the student read. We can relate the speed of reading with the level of comprehension. We can look at the eye movement and the facial expressions to figure out what has been understood and what's

not comprehensible for the student. We can detect the student's mood changes during this study activity. We can connect if the student was able to relate today's reading with an earlier piece of reading.

The student then starts to write. Let us continue to observe and record the student, measure the writing competences and identify writing gaps. Let us move further towards the student's ability to conceptualize, critically think, communicate commendably, narrate stories, apply learned knowledge, compare performances in problem solving, and so on.

With analytics, we can connect all these observations together under a unique model of the student's learning.

We will be able to not only make sense of what is observed under analytics and relate them, but also analyse existing insights and discover insights. For example, insights on a group of students' use of open educational resources and the resulting rate of attrition, or the writing competence of a student and the likelihood of attention deficiency of the student. Insights are not confined to the domain of study, but they expand further into other areas and disciplines as new datasets become available and new pieces of knowledge percolate.

Analytics can collect data continuously, even on a second-by-second basis, as long as it is put to good use. Imagine a grandmother being able to see on a daily basis what the grandson has achieved; a politician appreciating the impact of a governmental policy on learning outcomes achieved by the students of a province; an educational administrator being able to map outcomes achieved by the students towards a target industry. Such a close-knit society of learners and learning-enablers is what I envision as a by-product of analytics.

Of course, analytics should be held strictly accountable for privacy, security, anonymity, and ethical regulations. Every piece of data we collect under our learning analytics research will be ethically clean before being used.

Marie: What is your view on social media in the online learning environment?

Dr. Kumar: I believe it is an essential part of the learning environment, mostly because it aids, going back to the mandate I mentioned before, in the knowledge creation process. Universities have a responsibility to the society to showcase their quality and efforts in creating knowledge. In addition to the formal channels of publication, the social media offers a non-traditional means to share the progress a university is making.

We should understand that social media is just one more media, one more outlet, one more communication channel. I don't want students to see this as the only chance of exploration.

In recent news, there is a speculation that traditional in-person shops would close down, not because people don't like the first-hand touch feel of the product before buying it, but because the same feel can be had through social media. Most don't really need to touch a product to see how well it is going to work for them; instead, they could go to a reliable website and look at the feelings and concerns



expressed by the users of that product. Such a believable, verifiable, participatory channel of expression is much more powerful than personal experiences. That is what revolutionizes the social media.

The same thing can be said about traditional universities. No wonder everyone is now after blended online learning [laughs]. Anyway, social media is really becoming a powerful tool.

Marie: How do you hone your teaching practices?

Dr. Kumar: When you go to a conference on teaching, you can hear about what happened in a particular classroom, how successful it had been with a group of students, and how one can possibly apply the same technique. I am not into generalized teaching techniques. Theory is fine, but teaching techniques and teaching practices are not generalizable unless one is absolutely sure.

Teaching requires precise information. One should not play with a 'slightly modified' technique just because it worked for someone else. Instead, one should investigate that technique and prove to oneself that the technique is transferable before applying it in a real learning situation.

Our research group is working on a computational approach for teachers to reflect on, regulate, compare and hone their teaching practices. The idea is being pilot tested and I hope to reveal the results in AU's social media channels first ahead of the regular publication channels.

Marie: If you could wave a magic wand and improve one thing about online education, what would it be?

Dr. Kumar: In learning analytics there is only so much we can do to estimate the mindsets of students. Their capacity to learn... their study constraints... their levels of motivation... their triggers to help them become better students... their cultural influences on learning, and much more. Is it possible for me, as a teacher, to get that holistic mindset, so that I can customize my teaching to suit the mindset of individual learners? If I had a magic wand, that's what I'd wish for: a causal computational model of the mindset of my students and a companion software agent that would guide me and the students to do our best. The future of our society is to be moulded by those who consciously do so and we need to research the means to enable them to do so.

Marie: If you could give one piece of advice for online learners, what would it be?

Dr. Kumar: Analyze your learning experiences and look for insights, continually, on a daily basis, on an hourly basis, whatever works for you. Students should demand that these learning experiences be made available to them. It is almost like doing your exercises or eating your apple every day. This is something you should build into our study culture. That is what I would advise to my students – proactively seek insights on your own learning.

Marie: So, how can I start analyzing my learning experiences?

Dr. Kumar: Do you have enough data, first of all, to analyze? Most students don't. Whenever I work with my computer I record it in a video. If I spend 45 minutes reviewing a paper, I record it. I want to

analyze the number of times I lifted my head as my concentration wavered, the quality of my audio notes, the ideas from the paper I liked and the ones I didn't, how many times I was interrupted during this work, would these ideas be of interest to my research assistants and colleagues, and so on.

Engaging in such reflection exercises allows me to understand my level of commitment. This kind of analysis is time consuming at the moment, but it helps me stay grounded with my work. It allows me to have a sense of the quality of my work and helps me keep my judgement keen. I would really like to see my students to take this approach.

People tend to think that they are losing privacy. Not at all, unless you lose your data. Try to collect data about your study habits as part of your critical thinking. Analyze it based on evidences that you have, not just based on some vague memory.

Marie: So, I could record it audio, video, or maybe a statistical software package?

Dr. Kumar: Yes, but not only record, because recording only gives you raw data. You have to translate that into pieces of information. Then classify that information into competences, say, I'm good at this and I'm not good at that.

Say, you recognize the competences that you don't seem to have, but have a good vision of your goal, four years down the road. Do a gap analysis and record the outcome of this thinking exercise. This character is something students should build as a day-to-day routine. By the time they finish their first year, they should have absolute confidence in this sort of analysis of their own progress.

I don't want students to see their progress or engage in this sort of analysis only when they see their transcripts. We are trying to promote students' own ability to analyze their own progress, quite regularly. With online learning, this is very possible and rather convenient. Basically, we are asking students to be researchers of their own self.

Marie: If you could confer one piece of wisdom on an upcoming student in computer science, what would it be?

Dr. Kumar: I would ask the student, "What would be your one contribution to humanity five years from now?" Then, the follow-up is, "What do you think humanity will think of your single contribution five years from now?" I want the student to compare, match these two viewpoints, and then work toward that goal. Collect, Reflect and Regulate.

Thanks for doing this, Marie. Best Wishes ☺