

## **PERSPECTIVES FROM THE INFORMATION TECHNOLOGY EDUCATION FRONT**

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### **Introduction**

When the third volume of *Agham Mindanaw* was being planned during the early part of July 2006, it dawned on me that not much has been formally written yet about information technology education in the Ateneo and its implications in the locality of Davao. I thought that volunteering to write an article about this would finally fill up this void and hopefully spur more articles in the future. There is so much to write about in this area with my many years as Director of the Ateneo Computer Science Center then, and now as Chair of the Ateneo Computer Studies Division. Other leadership positions in information technology education organizations in the locality of Davao and the national level for the past years are also rich sources of insights that I can draw from.

The discourse will start with a brief historical account of information technology (IT) in the Ateneo de Davao University (ADDU) then focus on three main themes, namely: (1) in-campus initiatives and footholds gained; (2) off-campus involvements and alliances gained; and (3) foundations of an IT ecosystem in the region.

### **Brief Historical Account of IT in ADDU**

I was still a student in the now phased-out Management Engineering (ME) Program when computer education and technology started in the Ateneo de Davao University (ADDU) way back in 1980 – that was 26 years ago. It all started with the pioneering work of Fr. Francisco Glover, S.J. with the ME Program, an honors program he handled that time. Together with a group of former students and alumni from the ME Program, they formed the Ateneo Institute of Computer Science (AICS) which then offered short-term courses in computers to the public aside from teaching computer subjects to the ME students that time. However, the core of the said group decided to leave the Ateneo at 1985 and formed their own company, named Digital Interface, which still exists now and is one of the leading computer vendors here in Davao City.

I was already one of the younger faculty then who decided to stay with the Ateneo and continued to handle the short-term courses in computers as well as the computer subjects of the ME Program. AICS was renamed then as the Ateneo Computer Science Center (ACSC). In around 1987, shortly after Fr. Antonio S. Samson, S.J. took over the presidency from Fr. Emeterio Barcelon, S.J., we opened a 2-year associate course in Computer Science. In the next few years, a number of faculty, which included me, were sent for graduate studies in Computer Science and when we came back, we opened a full-blown 4-year course in Computer Science in 1991. I was appointed as Director of the ACSC then. The first and second year students from the 2-year associate course who proceeded to the full-blown B.S. Computer Science Program graduated in 1993 and 1994 respectively. The first batch who started the full-blown B.S. Computer Science Program graduated in 1995.

Fr. Edmundo M. Martinez, S.J. came in as president in 1993 and took information technology to the hilt. During his administration, information technology took center stage and went hand-in-hand with the infrastructure build-up that he did for both the grade school and high school campuses in Matina as well as the college campus in Jacinto. The well-designed and magnificent buildings in both campuses were completed during his administration. The information technology

programs he initiated and supported were not only in terms of infrastructure, hardware and software, but also in the areas of faculty development, curriculum and instruction development, research, linkages, information systems, and training. In 2001, the ACSC spun off its services component into three separate offices with separate heads, namely: Technical Services, Training and Management Information Services. The ACSC was transformed into the Computer Studies Division under the School of Arts and Sciences and I chose to be its Chair while three of my senior colleagues in the former ACSC opted to head the three new offices. When Fr. Antonio S. Samson, S.J. came back as President last November 2005, the information technology infrastructure and programs were almost all in place.

### **In-Campus Initiatives and Footholds Gained**

After 26 years, from the simple beginnings of offering computer subjects in the ME Program and short-term courses to interested outsiders, information technology in the Ateneo campuses today has gone leaps and bounds in terms of infrastructure, hardware, software, academic programs, training and literacy, instruction and research resources, and automation of core business processes.

It would be worthy to note that both the Matina and Jacinto campuses currently have fiber-optic backbones and are connected via a fiber-optic link through the electric posts of the Davao Light and Power Company. The Jacinto campus has a fiber-optic last mile link to Globe InnoVe, our Internet service provider, with a subscribed bandwidth burstable to 10Mbps. Both campuses have around 1,500 computers installed for laboratories, libraries, classrooms and offices and most, if not all, are connected to the Internet. Software licenses have been judiciously acquired since the university has not yet totally embraced free open source software (FOSS).

Computer literacy has found its way down to the pre-school and grade school levels where the little kids learn the rudiments of computer use through weekly IT classes. There are efforts to develop a vertically articulated IT curriculum starting from the pre-school level to the graduate school level. The college level now has three IT undergraduate programs (B.S. Computer Science, B.S. Information Technology, B.S. Information Management) and two IT graduate programs (M.S. Information Technology, Master in Information Technology). Most, if not all, degrees in the college have at least one computer elective subject in their curricula.

Faculty in the college cannot be promoted to permanent status if they don't take and pass the IT proficiency examination. Syllabi are posted and updated in a Web server and a number of online classes have been initiated. A number of multimedia classrooms and laboratories have been created to facilitate better instruction. Core business processes such as enrolment, student records and finance management have been automated to facilitate better and faster service to the stakeholders of the university.

These are just a few of the initiatives that have gained foothold along the years and have somehow gradually incorporated information technology into the very fabric of university life and programs in the Ateneo. We would not have progressed this fast if not for the forward-looking initiatives of higher administration together with the IT community of the university.

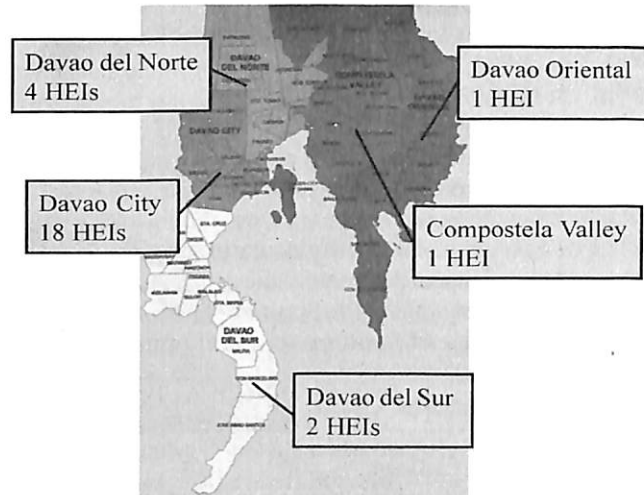
However, the challenge at hand now is to take stock of what we have and plot directions that can capitalize on the vast IT resources we possess and the potentials that they can bring. Much of the work in the past years has been on resource- and capacity-building. The next step, I would propose, is to transform these resources and capacities into ventures that would directly contribute to the development of Davao City, the region, and Mindanao in general. Whatever shape or form these ventures will take will depend largely on how we read the environment and how we can appropriately respond to opportunities that may come along. This requires a different kind of mindset that goes beyond the ordinary way of looking at and doing things in the university.

### Off-Campus Involvements and Alliances Gained

After many years of developing the inside, I saw the need to interface with other IT educators from the other schools in the region and also wanted to know their growth stories as well as common concerns and dreams. In the process of interfacing and comparing notes with other IT educators, we saw the need to organize ourselves into a cohesive organization. This started the beginnings of the Davao regional chapter of the national organization Philippine Society of IT Educators (PSITE) way back in 2001. I headed the PSITE Region XI chapter (PSITE-XI) as President then. In 2002, I was elected as National Vice-President for Mindanao in the PSITE National Board and continue to hold this position until the present. I also continue to be part of the local Board of PSITE-XI as past president.

Also at the latter part of 2001, through the prodding of the Commission on Higher Education (CHED), the Council of Deans for IT Education in Region XI (CDITE-XI) was formed. It is composed of all IT Education Program Heads from all member schools in the region. In year 2004, I came in as the next President of CDITE-XI and I continue to hold this position until the present.

To date, there are 26 schools in the region, including ADDU, that are offering information technology education courses. There are 18 in the Davao City, 4 in Davao del Norte, 2 in Davao del Sur, 1 in Davao Oriental, and 1 in Compostela Valley (Figure 1 and Table 1). CDITE-XI focuses on the concerns IT Education Program Heads/Administrators while PSITE-XI focuses on the concerns of IT Educators in general.



**Figure 1.** Number of Higher Education Institutions with IT Education Programs in Region XI.

CDITE-XI and PSITE-XI share in the vision of transforming Davao as the IT Education capital of Mindanao. The desired future state is that all schools offering IT Education courses in the region will have the same level of quality education for all IT Education students. Davao will then be known as the source of highly competent and efficient IT professionals with sound social and ethical standards. This will be the IT academic sector's contribution to the overall vision of ICT Davao (a forum of leaders from the different IT organizations in Davao) in transforming Davao into the premiere ICT hub and capital of Mindanao and the Philippines.

Five main programs define CDITE-XI and PSITE-XI, namely: (1) Administrators and Faculty Development; (2) Academe-IT Industry Linkages; (3) Inter-School Cooperation; (4) Advocacy; and (5) Networking. For the past years, the activities of CDITE-XI and PSITE centered on seminar/trainings and conferences, periodic dialogue with the local IT industry, academic partnership programs with technology providers, curriculum standardization of the BSCS, BSIT, BSIM programs, research development, expertise- and resource-sharing, student competitions, and representation in sectoral and inter-sectoral consultations. Common frameworks for student practicum and faculty immersion are in the pipeline this schoolyear. The integration of Technopreneurship modules into the BSCS, BSIT, and BSIM curricula are also on the drawing board in partnership with the Philippine-Australia Human Resource Development Facility (PAHRDF) and the Davao City Chamber of Commerce and Industry Inc. (DCCCII).

Table 1. Higher Education Institutions with IT Education Programs in Region XI.

	Davao City	BSCS	BSIT	BSIM
1	AMA Computer College	✓	✓	
2	Ateneo de Davao University	✓	✓	✓
3	Brokenshire College	✓	✓	
4	Christian Colleges of Southeast Asia	✓		
5	Davao Doctors College	✓		
6	DMMA College of Southern Philippines	✓	✓	
7	Holy Child School of Davao	✓	✓	✓
8	Intercity College of Science & Technology	✓	✓	✓
9	Interface Computer College	✓	✓	
10	John Paul II College	✓	✓	
11	Jose Maria College	✓	✓	
12	Philippine College of Technology	✓		
13	San Pedro College	✓	✓	
14	STI College of Davao	✓	✓	
15	University of The Immaculate Conception	✓	✓	✓
16	University of Mindanao	✓	✓	
17	University of the Philippines for Mindanao	✓		
18	University of Southeastern Philippines	✓	✓	
<b>Davao Del Sur</b>				
19	Cor Jesu College	✓	✓	✓
20	South Philippines Adventist College	✓		
<b>Davao Del Norte</b>				
21	Aces Tagum College		✓	
22	Davao Del Norte State College		✓	
23	St. Mary's College	✓		
24	UM Tagum College	✓		
<b>Compostela Valley</b>				
25	Estela College	✓	✓	
<b>Davao Oriental</b>				
26	Davao Oriental State College of Science & Technology		✓	

PSITE-XI, and practically CDITE-XI also, is part of a national organization, PSITE, whose main mission is to improve the quality of IT Education in the country. Its recurring theme for the past years has been "building an IT-enabled nation". There is great potential in this national network of IT educators. A school like Ateneo de Davao University can only do much in the noble effort of building an IT-enabled nation. But the combined and systematic efforts of all member schools of the national network can make this dream realizable. There are already local chapters in almost all regions in the country to spearhead local efforts. What is good with a national network is that the local efforts of a single school or a regional chapter find meaning and

relevance when aligned with a national plan of action. It is not a farfetched reality that PSITE will make a significant impact in the information technology education landscape of our country in the immediate future through the dynamic interventions of regional chapters and member schools all over the country. And the Davao IT academic sector is proudly in the forefront of this snowballing movement.

### Foundations of an IT Ecosystem in the Region

I seemed to have painted a rosy picture of the information technology education landscape in the Ateneo, the locality of Davao, and to some extent, the country. But what keeps on disturbing me until now is the reality that most of our best graduates from the BSCS, BSIT, and BSIM programs get lured to work in Cebu, Manila, and other urban provinces after graduation – not in Davao. I cannot blame them for doing so because the “greener pastures” are not here in Davao but in some other places. I would not deny that I beam with pride when I hear good feedback about our alumni who are working in IT firms. There are already quite a number of IT firms from Cebu and Manila who hold their recruitment activities right in campus during the second semester with the hope of getting our best graduates – a clear indication that our graduates are being sought after. What continues to disturb me is the fact that our best graduates are contributing to the IT development of other places and not Davao – which reminds me of the saying “*kami ang nagsaing, iba ang kumain*”. The IT industry in Davao is so thin yet and does not have the absorptive capacity to accommodate all of our graduates, as well as those from other schools in the region. But this yearly brain drain cycle has to end somewhere. Davao does not deserve to be a human resource provider for other places forever.

But all is not lost. ICT Davao, the umbrella organization of all IT organizations in Davao, is well right on track with its efforts to put in place an IT ecosystem in the region involving academe, industry and government. The collective efforts are aptly coined the Silicon Gulf Initiative (with website at [www.silicongulf.net](http://www.silicongulf.net)). This involves the PSITE-XI and CDITE-XI from the academe, six organizations from the local IT industry (computer vendors, solution integrators, internet cafes, computer technicians, open source software community, corporate MIS professionals) and local legislators from the City Council of Davao. Also being invited to join are the Davao Inventors Association (DIA) and a core of professionals from ICT real estate firms. The whole idea is that academe develops the technological talents of Davao's youth, industry provides employment and a nice home, and government facilitates this synergy. The long-term goal is that Davaoños do not have to leave Davao anymore to find work and Davaoños who have left will be attracted to come back and help in the development of Davao – brain gain rather than brain drain.

At the heart of this collective initiative is the role of schools with IT Education programs (i.e., member schools of PSITE-XI and CDITE-XI) in molding future technopreneurs – IT professionals who translate their technology-based ideas into viable IT enterprises in the locality. More technopreneurs would mean more IT enterprises in the locality to spur economic growth. Integrating the technopreneurship mindset in the IT Education curricula will hopefully change the mindsets of graduating students that they can also be employers and run their own IT enterprises rather than just be employees. It becomes an opportunity and an option after graduation.

For technopreneurship to flourish in schools, a “technopreneurship ecosystem” has to be in place through these components, namely: curriculum, infrastructure, events.

Creativity and innovation in students will have to be developed early in the first three years of the curriculum. The students will have to be exposed to what's hot in Silicon Valley through the Internet, learn from successful IT ventures both locally and abroad, look into the technicalities of high-technology products, and be abreast with cutting-edge technologies that can be potential enterprise enablers. This can be achieved by requiring short 15 minute reports for each student for the whole class to hear in IT classes spread out in the three years. If this becomes a habit within their first three years, the students will hopefully be fertile with technology ideas when

They start with their thesis or senior project proposals. A formal technopreneurship course in the senior year will facilitate the creation of viable technology-based business plans.

The need for a Technology Research and Development Facility that can focus on evaluating and assisting technology-based business plans then becomes imperative. Seminars and trainings to beef up business plans may be provided. Pre-incubation services may also be provided such as computers and connectivity, mentoring and consultation, business development support, support services, and the like. Partnerships with industry can also be forged for certain projects. A technology licensing program can be anchored in this facility. Faculty from the Engineering and Business Divisions as well as the Law School can be involved in the facility.

A school-based business plan competition and inter-school business plan competition can be organized as annual events. Assistance can be sought from the Philippine Emerging Startups Organization (PESO) which holds a national business plan competition every year. Highlights of projects can be presented as researches in annual student conferences such as the IT Students Congress (Davao) or Y4IT Congress (Manila). Projects with IT faculty involved can also be presented as researches in annual conferences such as Mindanao Conference on IT Education (MITE), National Conference on IT Education (NCITE), Computing Society of the Philippines Congress (CSPC), and the like. Winning and commendable business plans will be recommended for incubation with the appropriate support.

This three-pronged approach will hopefully encourage the graduating students to pursue technology-based business plans as startup enterprises, initially assisted by technology-business incubators, and eventually graduate as full-blown small and medium IT enterprises (ITEs) competing in the domestic and global market. This means that the local IT industry has become ready with more technology-business incubator centers to absorb interested graduates, especially those who opt to be startups and more IT parks to absorb mature and stable IT enterprises.

We intend to implement this three-pronged approach in the Ateneo by next school year. The "curriculum" and "events" components can be implemented without much hitches but the "structure" component will require a convincing proposal to the administration. I see the school-based "technopreneurship ecosystem" as a feasible solution to the yearly brain drain that plagues our BSCS, BSIT and BSIM programs. It may take some time to take root and flourish but just like the steady growth of sturdy trees in the forests, it will be worth the wait.

Schools with IT Education programs play a fundamental and crucial role in the IT ecosystem put in place by stakeholders in the IT community of Davao. If most of these schools in the region adopt the three-pronged approach, and the technology-business incubation centers and IT parks are also all in place, Davao will finally be the preferred "greener pasture" and home of our IT enterprises. I would like to see that happen in my lifetime.