The State of Business Intelligence in Academia 2010

In fall 2009, the BI Congress distributed a survey asking academics associated with the Association for Information Systems about business intelligence (BI) at their universities. The intent was to obtain a general understanding for the current state of BI in academia. The survey identified that professors were beginning to introduce BI into university curricula by including BI content within existing classes and initiating BI degree programs and concentrations. However, the 2009 BI Congress event found that professors have many hurdles to overcome as they try to move BI forward in universities. Further, current practices may not be enough; gaps still exist between what companies and students need and what universities are offering.

To pursue the state of BI in academia at a deeper level, the BI Congress II re-administered the original survey in fall 2010 – and created two additional instruments to capture student and practitioner/recruiter perspectives. The student survey was sent to the study’s professors to pass along to their students. The recruiters and practitioners were reached through the BI Congress II sponsor channels, mainstream BI professional channels (e.g., TDWI, B-Eye Network), and select university recruiting listservs.

The following report presents the responses from all three respondent groups: professors, students, and practitioners/recruiters. The report was used as input for discussion during the 2010 BI Congress II in St Louis, MO on December 11 and 12, which was delivered by the Special Interest Group for Decision Support Systems and the Teradata University Network, and sponsored by Teradata, SAS, IBM, Deloitte Consulting, MicroStrategy, EMC, and Baseline Consulting.

For the purposes of this report, we define business intelligence (BI) as a broad category of technologies, applications, and processes for gathering, storing, accessing, and analyzing data to help its users make better decisions. We use the terms BI and Analytics interchangeably.

Through 2011, we will produce additional deliverables regarding the current (and future) state of BI in academia. In the meantime, this document provides preliminary results for those who were kind enough to complete the survey. Thank you for participating!

Faculty Survey

The following universities were represented by professors in this study:

- American University of Sharjah
- Arizona State University
- Auburn University
- Augusta State University
- Babson College
- BeiHang University
- Bentley University
- Berner Fachhochschule, Technik und Informatik
- Boise State University
- Brigham Young University
- Central University Las Villas (UCLV)
- Corvinus University of Budapest
- CSU Monterey Bay
- Curtin University
- Dakota State University
- Eastern Michigan University
- EBS Universität für Wirtschaft und Recht
- ESADE Business School
- Florida Atlantic University
- Florida International University
- Florida State University
- Fordham University
- Georgia State
- Goethe University

Wixom, B. H. and T. Ariyachandra (2011). *State of Business Intelligence in Academia 2010, BI Congress II.*
BI Offerings

Based on the 173 professors who responded to the survey, the following graphs show the number of non-BI courses with BI content, BI courses, concentrations and degrees that have been in place for over a year and those that are under consideration.

<table>
<thead>
<tr>
<th>Have been in place:</th>
<th>Under consideration:</th>
</tr>
</thead>
</table>

Three schools report having an undergraduate degree in BI: Augusta State University, St. Joseph’s University, and Stuttgart Media University (Germany).

Twelve schools report having a graduate degree in BI: Augusta State University, University of Denver, St. Joseph's University, Stuttgart Media University (Germany), Sofia University (Bulgaria) North Carolina State University, Singapore Management University (Singapore), Texas Tech University, Loyola University Chicago, Xavier University, University of Muenster (Germany), and Universidade Portucalense (Portugal).

Current BI Courses

Note the diversity of offerings. Many of the highly specialized classes are offered within concentrations or degree programs.

<table>
<thead>
<tr>
<th>Accounting, Managerial</th>
<th>Data Warehousing (13)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Artificial Intelligence or Expert Systems (6)</td>
<td>Data Warehousing and Data Mining (6)</td>
</tr>
<tr>
<td>Bio Informatics</td>
<td>Decision Support Systems or Decision Making (36)</td>
</tr>
<tr>
<td>Business Analytics (12)</td>
<td>DSS and Quantitative Modeling (5)</td>
</tr>
<tr>
<td>Business Intelligence (45)</td>
<td>Emerging IT (4)</td>
</tr>
<tr>
<td>Business Intelligence and Knowledge Management (5)</td>
<td>Enterprise Intelligence/Applications/Data (5)</td>
</tr>
<tr>
<td>Business Intelligence in Marketing or Finance (2)</td>
<td>ERP (8)</td>
</tr>
<tr>
<td>Business Intelligence, Advanced (5)</td>
<td>Geospatial analytics</td>
</tr>
<tr>
<td>Business Intelligence, Applied/Practicum/Tools (14)</td>
<td>Information Resource Management (7)</td>
</tr>
<tr>
<td>Business Intelligence, Data Warehousing, and/or Mining (7)</td>
<td>Information Technologies, Systems (6)</td>
</tr>
<tr>
<td>Business Reporting (2)</td>
<td>Introduction IS course of some flavor (9)</td>
</tr>
<tr>
<td>Category Mgt</td>
<td>IS Architecture</td>
</tr>
<tr>
<td>Corporate Finance</td>
<td>IT and the Intelligent Enterprise</td>
</tr>
<tr>
<td>Customer Relationship Management, Database Marketing (6)</td>
<td>IT Management, IT Strategy (9)</td>
</tr>
<tr>
<td>Data Analysis / Simulation (3)</td>
<td>Knowledge Management (5)</td>
</tr>
<tr>
<td>Data Integration, ETL (4)</td>
<td>Management – Issues, Strategy (2)</td>
</tr>
<tr>
<td>Data Management and Data Warehousing (5)</td>
<td>Management Information Systems, BIS, CIS (19)</td>
</tr>
<tr>
<td>Data Management or Database (40)</td>
<td>Management Science</td>
</tr>
<tr>
<td>Data Management, Advanced (9)</td>
<td>Managing the Digital Revolution</td>
</tr>
<tr>
<td>Data Mining (many had BI also in title) (30)</td>
<td>Market Research (2)</td>
</tr>
<tr>
<td>Data Modeling (of some form, such as OLAP) (6)</td>
<td>Operations Research (3)</td>
</tr>
<tr>
<td>Data Structures and Algorithms</td>
<td>Oracle</td>
</tr>
</tbody>
</table>

What Disciplines Teach BI?

- MIS, IS, or IT: 163 responses
- Statistics: 37 responses
- Computer Science: 31 responses
- Marketing: 30 responses
- Operations Research: 20 responses
- Accounting: 17 responses
- Other: 10 responses
- Systems Engineering: 9 responses


What Academic Alliance Programs are being leveraged?

- Teradata University Network: 85 responses
- Microsoft: 73 responses
- IBM Academic Alliance: 49 responses
- SAP University Alliances: 49 responses
- Oracle: 24 responses
- SAS onDemand for Academics: 21 responses
- Other: 8 responses

Other includes: Don’t know, University of Arkansas, Qliktech, Tableau, Centre for Monitoring Indian Economy, software bundled with textbooks, and Smart eVision. Teradata University Network includes software from: Teradata, MicroStrategy, University of Arkansas, Tableau, KXEN, and SAS. IBM Academic Alliance includes SPSS and Cognos software. SAP University Alliances includes Business Objects software.
What are the Challenges in Teaching BI?

Other includes: coordinating with other departments, failure of administration to understand the complexities of teaching these topics, students' fear of numbers, only moderate job market demand (2), non-MIS faculty acceptance (2), lack of statistics training for students, and student demand.
Comments from Faculty Survey Respondents:

- Faculty are both the source of the BI problem and the solution.
- Business Intelligence should be at least mentioned in every college course so that students have been exposed to the concept no matter what major they are pursuing.
- Student interest in our program is focused on the business issues more than the technology.
- Need to better link ERP/CRM systems to BI.
- It is a great initiative to promote this important topic within MIS curriculum.
- We have just added an undergrad concentration in BI beginning Fall 2011.
- The list above contains mostly business school courses. I only identified one in the engineering school, but could be missing others. I could have expanded the list to include general courses in statistics, databases, etc, which all contribute to BI, but I kept it limited.
- Our employers are asking for these skills more each year.
- We (at TUN) need to find ways to provide instructors ways to include BI content in introductory classes so that students develop an interest, which in turn makes it easier to offer a class in BI. Without sufficient interest (aka registered students), it is not possible to offer new courses in these budget-constrained times.
- We have high employer demand.
- Academia needs to get up to speed on BI quickly, so our students do not fall behind.
- Broad topic. Seems to me that pivot tables and Dashboards can be classified as BI. In fact, if it cannot, we have only one BI course – Business Data Mining.
- Industry partnerships are going to be crucial in resolving some of the issues, especially those of obtaining data sets and providing meaningful experiences.
- I believe a solid background in BI could be very useful in the areas of Security and Risk analysis (same methods and tools could be used). I would like to hear from anyone who would like to collaborate.
- Our undergraduate major is severely constrained at present by lack of student interest and lack of resources. Its long-term viability is unclear. The name "BI" would not sell here, so it is not used in any course title or description.
- BI is interpreted quite differently by different people, with a wide range of focus (from managerial to technical emphasis). In my opinion, data and text mining and computing/statistical foundations should be more emphasized to equip students with relevant skills and knowledge to derive value from increasing volume of data in business. However, many existing BI textbooks are written from a managerial perspective and lacks rigorous content on the technical side of BI. We do not have enough up-to-date case studies as well. There is a need for better curriculum guidelines and resources for BI educators and students.
- Our IS&T department is spearheading a new emphasis in BI for fall 2011. We have not offered courses yet and are just finalizing curriculum approval.
- BI needs to be thought of more as an instrument of innovation and strategic management.
- This is viewed from Social Science. Although there are cross-faculty collaborations, I'm not that familiar with teaching at the other faculties like Tech and Science. We launched a new bachelor in “IT & Data Management.” But we will have to postpone it due to lack of students :-(
- We need more focused research tracks on tools, technology, trends, and industry, in addition to the numerical and quantitative papers out of computer science. The latter intimidates students.
- Need a clear definition of BI, its goals, scope, techniques, software tools, etc. It's more a concept than a discipline for the time being.
- For academics, BI is a fad at worst or a fashion at best. In either case, it is not new and therefore does not garner the research focus of many.
- The Center for Advanced Analytics and Business Intelligence is leading in BI-related education at Texas Tech University.
- While I think that BI is extremely useful for students going into the job market, given the current economic situation, there are really no resources to offer BI as a course by itself.
- There is a natural tendency to focus on quantitative modeling for BI (I concur); however, we ought to embrace Competitive Intelligence as part of BI (environmental scanning—both quantitative and qualitative content). This topic may be addressed (if at all) in an Industry Analysis, Capstone Strategy or perhaps Marketing Research course.
- A general introduction to BI is offered in our MBA IT course; it would be good to introduce it as part of a graduate course, but we have no plans to do so.
- In addition to Nihon University Graduate School, we are lecturing at Meiji University Liberty Academy – ten lectures on BI in the fall semester. We have offered a BI Introduction Course for the past three years – and we have been involved in a bi-monthly conference of Business Intelligence Society of Japan for the past 18 years. We are differentiating BI from Competitive Intelligence.
- We are still planning a degree program in "Business Analytics."
- I believe BI is very relevant. Last year I saw tons of job openings in BI in Europe. That was the reason I created a course.
- BI is one course that can be taught by IS as a service course and/or a course to IS majors, although the focus and content obviously would be different. We were encouraged to offer the BI service course and are developing a “BI for majors” course. The latter is proving more difficult as we need to pull pieces from many existing IS courses as well as add content. And, finding a book on BI for IS majors has also proven difficult.
- The theoretical fundamentals in BI are very weak. This will block BI development.
- I do have a great dashboard-building software exercise to share. This software will be presented in a Tutorial session at AMCIS.
- Perhaps a specific mailing list for all academics involved in BI/BA teaching (along the lines of AIS World mailing list) would be nice?
- There is very little hands-on material. Most of my material and labs I created myself.
- BI is one of the largest specializations in our graduate program. Classes are over 100 students.
- The multidisciplinary nature of BI is positive, but this makes it hard to reach/inform students. University marketing does not understand DSS, BI, etc. and tends not to market specific courses or programs.
- I would suggest that maybe BI should be the new core MIS course that all business students take. I certainly think it should be required for all business students.
- Applied data sets – which are interesting and can be interpreted in several different ways – are needed. Students also need a scenario or story to provide motivation.
- I think that it would be interesting to have a check list of topics that instructors are teaching in their BI course(s).
- Finding software that would allow students to apply BI concepts, learnt with minimal startup time for a faculty member, is still challenging.
- I believe one of the biggest challenges is that BI cuts across many disciplines that will require time and energy from many people to provide an integrated platform for delivering a coherent curriculum to students.
Student Survey

339 students responded from 62 difference universities. The universities represented included:

- Arizona State University
- Baylor University
- Bellevue College
- California State University Monterey Bay
- Central Connecticut State University
- Clarkson University
- College of St Scholastica
- Columbia College
- University of Rijeka
- Florida International University
- Georgia Southern University
- Georgia Southwestern State University
- Institute of Technology Tralee
- Instituto Superior de Ciências do trabalho e da Empresa
- Instituto Tecnológico y de Estudios Superiores de Monterrey
- Universidade Nova de Lisboa
- Jaipuria Institute of Management, Lucknow
- Lamar University
- Lebanese American University
- Louisiana State University
- Loyola University Chicago
- Loyola University Maryland
- Management Center Innsbruck
- Melbourne university
- Monash University
- Northern Kentucky University
- Oakland university
- Oklahoma State University
- Payame Noor University
- Roosevelt University
- Saint Joseph's University
- San Diego State University
- San Francisco State University
- Santa Clara University
- Sherbrooke University
- Suffolk University
- Texas A&M
- Universität Stuttgart
- Universität i Ager
- University Maastricht
- University of California, Irvine
- University Of Cape Town
- University of Colorado, Denver
- University of Georgia
- University of Hohenheim
- University of Illinois
- University of Indianapolis
- University of Maastricht
- University of Maryland, University College
- University of Maryland, Baltimore County
- University of Missouri, Columbia
- University of Missouri, St Louis
- University of Nevada
- University of Rijeka
- University of Southern California
- University of Southern Mississippi
- University of Sydney
- University of Virginia
- Walden University
- Washington State University
- Xavier University

What is your current major?

Are you considering a career in BI?
The 117 responses to “why yes” basically fell into one of two categories. The student either finds BI really interesting and a good match for their personal competencies — or he/she sees the importance and future potential of BI in the workplace and wants to be a part of its growth.

If no, Why not?
There was more variety in the kinds of answer to the “why no” question. Some of the reasons for not pursuing a career in BI included:
- Other areas have more advancement potential
- My skills do not align well (e.g., I’m not good with numbers)
- No experience in the area
- Lack of interest
- Don’t know of any jobs in this area
- I’m already committed to a different area
- I have not heard of BI before
- Other career alternatives seem less limiting

What academic disciplines teach you BI?

<table>
<thead>
<tr>
<th>Discipline</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>MIS, IS, or IT</td>
<td>228</td>
</tr>
<tr>
<td>Marketing</td>
<td>81</td>
</tr>
<tr>
<td>Statistics</td>
<td>76</td>
</tr>
<tr>
<td>Computer Science</td>
<td>69</td>
</tr>
<tr>
<td>Accounting</td>
<td>43</td>
</tr>
<tr>
<td>Operations Research</td>
<td>23</td>
</tr>
<tr>
<td>Systems Engineering</td>
<td>25</td>
</tr>
<tr>
<td>Other Business</td>
<td>17</td>
</tr>
</tbody>
</table>
Have you taken at least one BI course?

<table>
<thead>
<tr>
<th>Yes</th>
<th>No</th>
</tr>
</thead>
<tbody>
<tr>
<td>319</td>
<td>20</td>
</tr>
</tbody>
</table>

I currently learn BI in the following way:

<table>
<thead>
<tr>
<th>Level</th>
<th>BI content taught within a non-BI course</th>
<th>BI course</th>
<th>BI concentration</th>
<th>BI degree</th>
</tr>
</thead>
<tbody>
<tr>
<td>Undergraduate</td>
<td>80</td>
<td>10</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Graduate</td>
<td>110</td>
<td>90</td>
<td>10</td>
<td>0</td>
</tr>
<tr>
<td>Exec Ed</td>
<td>60</td>
<td>40</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Continuing Ed</td>
<td>50</td>
<td>30</td>
<td>20</td>
<td>0</td>
</tr>
<tr>
<td>Certificate</td>
<td>40</td>
<td>20</td>
<td>10</td>
<td>0</td>
</tr>
</tbody>
</table>

The reasons students provided for taking BI courses include:

- It looked interesting
- It was a requirement
- To prepare for a career in BI
- The content aligned with personal capabilities
- Curiosity about BI
- BI is integrated into the curriculum
- The professor is good
- It fit my schedule

The reasons provided for “no” include a lack of BI offerings, timing, or a lack of a BI class requirement.

Why did you choose to take a BI course?

![Bar chart showing reasons for taking a BI course]

Please provide your opinion of the following BI capabilities:

![Bar chart showing opinions on BI capabilities]

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Wixom, B. H. and T. Ariyachandra (2011). *State of Business Intelligence in Academia 2010, BI Congress II.*
How can your BI education be improved?

<table>
<thead>
<tr>
<th>Option</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>More/better real-world software</td>
<td>189</td>
</tr>
<tr>
<td>More/better real-world data sets</td>
<td>163</td>
</tr>
<tr>
<td>Cleaner link to jobs</td>
<td>154</td>
</tr>
<tr>
<td>Better case studies</td>
<td>145</td>
</tr>
<tr>
<td>More/better statistics/training</td>
<td>105</td>
</tr>
<tr>
<td>Discussed professional</td>
<td>77</td>
</tr>
<tr>
<td>A better textbook</td>
<td>77</td>
</tr>
<tr>
<td>More current content</td>
<td>74</td>
</tr>
<tr>
<td>More prepared teachers</td>
<td>55</td>
</tr>
<tr>
<td>Other</td>
<td>5</td>
</tr>
<tr>
<td>Other</td>
<td>3</td>
</tr>
</tbody>
</table>

What academic alliance do you use?

<table>
<thead>
<tr>
<th>Alliance</th>
<th>Number of Responses</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teradata University Network</td>
<td>166</td>
</tr>
<tr>
<td>Microsoft</td>
<td>122</td>
</tr>
<tr>
<td>SAS Academic Program</td>
<td>68</td>
</tr>
<tr>
<td>IBM Academic Alliance</td>
<td>41</td>
</tr>
<tr>
<td>SAP University Alliances</td>
<td>35</td>
</tr>
<tr>
<td>University of Arkansas</td>
<td>30</td>
</tr>
<tr>
<td>None</td>
<td>24</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
</tr>
<tr>
<td>Other</td>
<td>8</td>
</tr>
</tbody>
</table>
Comments from the Student Survey Respondents:

- Academia does not provide the experience required by business. Having finished a BI track, there is no way a recent graduate can accomplish anything close to real life. Real-life has many complexities, which a student is not exposed to. I had absolutely no training on data quality and DW loading, which is one of the critical processes in BI.

- As a grad student working toward an MIS and working full-time in marketing (when I'm not battling unemployment in a tough economy), it's been difficult for me to figure out how to make the transition into a BI type role without having to start from square one. It would be nice to know where BI internships are available for credit.

- As a current professional in BI area, I will be happy to assist in any manner to make BI offerings at XU more interesting/productive and worthwhile to XU students as well as help XU build reputation in BI/DM area.

- As I had mentioned in one of the comments, I am responding to this survey with my knowledge of things about LSU, which does not have a BI program. I do have a concentration in BI during my MBA program at Xavier so I am very familiar with what it is. There just is no program at my current University.

- The BI concentration is relatively new. I have over 15 years of experience in IT industry including database skills but still I'm finding it bit difficult to move into BI (Data mining / Analytics) as I don't have direct relevant experience. It will be a big help if there are campus recruitments.

- BI can still grow here at ITESM, but it is on a good path.

- BI is an interesting area of study in the future because it integrates technology and information – and is really interesting.

- It would help to be shown real-world cases or see how companies use BI in every-day operations.

- Exposure to SAP software needs to be included in the curriculum.

- I had a great Prof and great content, but the class really needed to be broken up into more than one semester.

- I believe Loyola's BI program has been best in class with great teachers and current information.

- I feel that this field of study isn't advertised as well on the CSUMB campus as all the other concentrations. I think this concentration is more beneficial than some other ones. I think students need to be exposed to more programs, like Microsoft Access, RedHat, Unix/Linux, etc. throughout their educational time in school because it sets a better foundation for their senior year and their future careers.

- I find BI interesting, but in my class it’s really boring and uninteresting because all of the articles we read rehash the same ideas and solutions over and over again. I know that a company will do better with BI in place already. I need to do some projects and actually play with it, not just read articles.

- I have experienced that it is very important to be able to tell the story behind the data, so a strong focus on this would be very good.

- I have professional interest in knowing BI concepts, the technology, and the general processes - not in becoming a "hands-on" expert. I need to understand just enough to know what can be done and where to get it in order to give advice and determine specifications. My BI course is not ideal to me, although I’m sure it’s quite good to those who are technicians, BI consultants, or analysts. I would suggest a course with a different designation and scope, thinking in the growing interdisciplinary nature of teams.

- I have thoroughly enjoyed my BI course as a IT current event course. I feel more powerful knowing what I know from the course and do not imagine I could learn it anywhere else.

- I learned BI in a complete context and structure. I started first with transactional systems, moving then to data warehousing, BI and basics of analysis tools, such as data mining. The more advanced the topic,
the less practical it was. In the BI case, I used a couple of tools to create class projects and received direct learning from a few BI vendors, such as MicroStrategy and MS. But I mostly learned how to use the tools – and the tools were just the example of the topic. In a business perspective, it is like I had the business cases adapted to the tool, and not the tool adapting to the business cases.

• I think business intelligence is underestimated in universities nowadays, and I think promoting it is of great importance for achieving better prepared professionals to provide the skilled people needed in the working world.
• I think is an excellent concentration.
• I think textbooks on BI can become outdated fast, so my recommendation is to incorporate current articles on best practices into the curriculum. In addition, business professors should be encouraged to include BI concepts in their courses.
• I think there should be more courses available.
• I wish the BI courses were offered in Tulsa. This is a difficult course to take as a distance learning class.
• I would like for the class to go a little bit deeper in creating a BI project, almost implementing it. The inconvenience is that not everyone in the course is from the same major, and not everyone understands about database administration or concepts.
• In my case the professor was largely unaware of BI in the real world. He really stuck close to the assigned text book and hands-on work was limited to building an expert system with covad and creating star diagrams.
• In my course, the subjects I chose were excellent for fostering a career in BI/Analytics.
• It is a growing field that deserves more attention in all undergraduate and graduate business schools!
• It is a tough industry to break into if you do not have clear connections.
• It is an interesting course, and the professor does an excellent job conveying the concepts of BI.
• It is great that we have access to learn about BI and use it in the classroom environment, but help with finding jobs after graduation would improve the program, in my opinion.
• It seems interesting, but we haven't gone too far into it yet.
• It would be nice to learn more about BI careers.
• It would be very convenient to develop careers in Mexico referring to BI. We need more jobs in that area and more education as well. I will love a scholarship to continue my studies in this area.
• It's in its infancy for the most part, but BI in academia is on the way up. Xavier has a great program that should continue to grow.
• My teacher did a great job teaching my Business Intelligence and Data Mining class. That class was the most interesting and challenging IS class that I have taken at Loyola.
• Loved the database management class with introduction to coding. I also would have liked an intermediate coding class for non-programmers.
• Many businesses are interested in BI skills, so the program is very important and helpful.
• More interdisciplinary work between areas of application, e.g. Finance, Process Management, and BI courses.
• More involvement from professionals to show students what an actual career in business intelligence entails would be useful. Statistics, though taught in a separate course, are often forgotten by students, including myself. Therefore, a refresher or course in statistics relating specifically to business intelligence would be useful. For students such as myself, using the tools such as SAS Miner are great for learning, but taking a more in depth look at what is actually occurring in the system would help clear up a lot of questions about business intelligence systems.
• More use of relevant BI tools using real-world data sets.
• My professor was amazing, but there are just not enough professors out there that specialize in this area and/or have real world knowledge in this arena. I am actually going to be applying to a PhD program in QA with the intention of eventually working more within this area - most likely in academia.
• Need more connections to employers.
• Our graduate program in the management of information technology could only give us a cursory overview of BI.
• People with prior diverse experience and continuing degree programs find it difficult to break into the functional part of BI. At least, I did.
• Projects are the best way to learn. Simply following a handout that takes you step by step is easy, but I want a more in-depth experience.
• Some sort of software should be provided to the students so that there are no licensing issues later, and the student can keep on practicing BI skills even after the semester or the course is done.
• Students should have more access to real life problem situation sets with live projects based on BI.
• The BI classes in this school are very boring because we practice only one exercise during just a single class! Also, the course is given only by one teacher, so if you don’t like the teacher you don’t have other possibilities to take the course with other teachers to try other ways of learning.
• The BI course was one of the most interesting courses I participated. The book my professor used was very good and understandable as well as the course.
• The course work seems very basic in the MBA program, and I’m not sure I would feel comfortable jumping into a career in BI without first working in the area.
• The degree needs be more specific to an area of expertise.
• The fact that we have to use Microsoft Access in our database management class is disappointing. No IT department in any business would promote the use of this "database." We need more applications that businesses today use. Also, it would be nice to have various levels of BI classes. For example, for the students who have no experience whatsoever can take the beginning BI classes, while people who are already in a BI career path and have some experience can take more advanced classes.
• The knowledge of BI is just spread around the IT students. To get BI into the companies, there should be more information in non-IT courses. Normally, I wouldn’t know something about BI if I had not looked for it by myself.
• The lack of BI case studies means that a number of cases used in class are out-of-date and seem less relevant in light of current practices and technology.
• The rest of the department’s professors seem to have a lack of understanding of what the concentration can offer or even is at XU.
• There are so many thoughts, but the most important thing is where can I get a job when I graduate?
• This is an exciting field, but it seems that you need to be in the business and then more into BI. I am not finding companies willing to hire new graduates into BI jobs.
• We actually have a Concentration on BI, and it gives you a totally different perspective about every single business.
• We definitely need more practical exposure with the real world software.
Practitioner Survey

219 practitioners responded to this survey. 176 of these respondents actually participate in the hiring process. Other than the demographics and final comments, the questions are based on the responses from these 176 individuals.

Company location:

Company Type:

Wixom, B. H. and T. Ariyachandra (2011). *State of Business Intelligence in Academia 2010, BI Congress II.*
Your position:

From where do you hire BI skills?
What level of student do you hire?

The following skills are important for BI jobs:

- Communication
- Data mgmt (eg. modeling)
- Business Knowledge
- Requirements, SAD
- SQL and queries
- Reporting, OLAP
- Data warehousing
- Statistics, mining
- BI software
- Research methods
- Software development

Number of Responses:
- Undergraduate: 113
- Graduate/Executive: 92
- Students with certification: 12

Strongly Agree
Agree
Neutral
Disagree
Strongly Disagree
How important is the following for the hiring process?

What kinds of jobs are available for students out of universities?
What are the primary challenges of hiring students into BI jobs?

- Competitive environment can be tough to land the top candidates from major universities. Candidates are often unknown quantities. Most have some core skills, but there is no way to tell if they can apply their skills and themselves adequately. BI projects typically require experience and are hard to be successful in without this. New students without previous work experience often are in over their heads initially.
- Actual business experience.
- Amalgamating skills & learning so the response isn't formula driven. New grads look for the "right answer" instead of thinking critically to think through the problem and develop new solutions.
- An understanding of both IT and business.
- As an engineering organization and having to use federal hiring guides/policies/rules, we are limited in who we can hire with non-engineering/science degrees.
- As expected, lack of practical business experience.
- Assessing the behavioral characteristics of students.
- Availability of students with right skills.
- Better analytical questioning. No business user adequately can define their "real" needs. A good BI professional can interpret needs and deliver above and beyond initial scope. My basic belief is the best BI comes directly from the business line. The more business professionals who have BI / systems knowledge, the better BI will be. BI and data analysis should be just as core a staple at universities as finance, accounting and marketing!!!! Much of the next century will be driven by professionals who can process, interpret, and act on the huge data that businesses and the internet produce.
- BI is not a mature discipline within academia. Without real-world experience, I would assume any new grad knows something, but not enough, to be of real value until they got trained up a bit. That being said, I would rather hire someone with a BI theory background than someone without that view.
- BI is not taught in much depth in most university programs. Real-world examples from class are frequently not deep enough.
- BI is not taught at universities or not in-depth.
- I can't find them.
- Communication and business knowledge.
- Communication skills coupled with the technical skills.
- Communication/people skills.
- Current market is making college hiring harder in general as experienced people are in the market and willing to take less pay.
- Determining modeling skills and BI expertise.
- Enough experience.
- Experience.
- Finding a good mix of technical and business skills. Too often students are skewed too far one way or another.
- Finding people with computer skills who understand business.
- Finding the right mix of experience.
- Finding students who have strong skills working with the business to understand and define the BI-related functionality. Also, finding students with background in OLAP and MOLAP.
- Finding students with experience working with datasets and experience with data mining and relational database experience like SQL.
- Finding technical students with good business acumen or finding business students with good technical aptitude.
• Finding the blend of data skills, business acumen, and communication skills needed to be a strong consultant hire. The balance is the key.
• Finding the broad mix of skills that are required.
• Finding the programs/students in order to target for speaking engagements for my company.
• Finding them before the competition does.
• Getting people with functional and technical experience.
• Hands-on experience with the tools.
• Hands-on experience.
• Hard to find the right mix of business and technology skills backed by relevant experience in applying those skills.
• Having to train hires on how to design and implement BI solutions.
• I haven't done much college recruiting.
• Having a clear understanding of the candidates’ analytical skills.
• I don't think most students are familiar enough with BI opportunities to focus on preparing themselves for the field.
• Identifying individuals with the right mix of communication, functional knowledge, and foundational technology skills. The mix is important for the individual to excel in BI.
• In our business, we love students who come out of school with BI expertise. However, we (consulting firms) also want folks who have more broad capabilities in technology as well as folks who can work well with our clients (strong interpersonal skills, communication skills, relationship skills). Finding a candidate with a combination of all of these skill sets is challenging.
• It is important to understand business acumen as well as technical aptitude to be successful with BI. Straight out of school, it’s hard to assess a candidate’s ability to excel at both the business and technology.
• Lack of actual working experience, which would strengthen the application of the BI knowledge gained through instruction.
• Lack of business acumen. Development methodology understanding.
• Lack of business experience/understanding (i.e., accounting, finance, strategy).
• Lack of business knowledge and KPI's.
• Lack of core understanding of BI fundamentals.
• Lack of data analysis experience and techniques.
• Lack of experience analytical approach to problem solving.
• Lack of experience with BI tools (too much of only MS Access or Excel); lack of experience with working with big data sets (i.e. lazy SQL and analysis techniques that don't scale); and a lack of inquisitiveness and a desire to understand and document business context for solutions.
• Lack of experience. Internship and hands-on project experience will help.
• Lack of hands-on experience.
• Lack of real world experience. Classroom based 'cookie cutter' projects do not transfer to some of the real world issues facing companies, vendors, or market space.
• Lack of real-world knowledge. Lack of perspective on how data was entered or what its purpose is or was. Lack of understanding of the business value of the data.
• Lack of skills and consulting knowledge.
• Lack of specific business knowledge, project management skills, and communications skills.
• Lack of tool-specific training.
• Lack of critical thinking skills and a difficulty synthesizing data into salient points. Students need to learn to challenge assumptions.
• Little to no proven experience with applying the concepts taught from an academic perspective.
• Matching experience to current needs. Is there enough experience that the person could satisfy the role needed?
• Most don't have any familiarity with the Microsoft SQL platform (SSAS, SSIS, TSQL) since the universities tend to focus on shareware (like MYSQL).
• Need industry practical experience, which can only be obtained via an internship or two years of client experience.
• No real experience. Some smart students don't know how the real world works. Millennial attitude :-)
• Not enough candidates who are strong in both business and BI. For example, MBAs in Marketing or Finance that have great BI skills.
• Not enough experience to hit the ground running as a consultant.
• Not enough of them!!
• Practical experience.
• Real-world experience with a variety of BI technologies. BI is broad in terms of the tools/technologies it uses, and it is hard for folks to get broad experience early in their career.
• Real world projects and technical students who don't have deep enough finance/accounting.
• Realistic expectations re: salary, workload, and immediate opportunities.
• Salary and location.
• Specific experiences with exact tools that will be used and an understanding of the business topics that will be applied.
• Storyboard and presenting, critical thinking and analysis, breaking down a business problem, and applying a solution.
• Strong SQL skills. If they have that we can teach the rest.
• Students aren't exposed to a variety of BI tools.
• Students who don't have reasonable expectations of what the job entails and the length of time necessary to learn the role before focusing on progression.
• The ability to ramp up experience fast enough to drive value.
• The curriculum is focused around software engineering, project management and software development. Need to put focus in BI related research and classes.
• The survey appears to focus on hiring students who have just received their undergraduate degree. If that is the case, the biggest challenge is that they have no real world experience. So, they are only hirable in the best of circumstances by a large systems integration firm or large software company that can train them. There is not a way to replicate real world experience in the classroom. The best you can hope to do is to teach them the "vocabulary," rudimentary SQL skills, and perhaps some reporting tool skills.
• The term BI is primarily missing from the educational curriculum. I am on the business side, so I am looking for someone with business acumen and BI awareness and skills, not IT skills. Looking inside of the MIS or Management Science programs, only very few have BI in the curriculum.
• Their communication skills often are not as developed or advanced as their technical skills.
• There is no formal curriculum for BI. Students have no or too little experience with data management skill-sets.
• They don't have the computer skills with SQL and Reporting Services or the tools.
• They need a macro understanding of Data Warehousing / BI techniques and to be able to master a tool set.
• They need excellent communication skills. A lot of students are great technologists, but they don't always have a good command of the English language.
• They usually come from an IT program and don't have the ability to apply business knowledge and perspective to the work they're doing. So they have difficulty anticipating needs and adding additional value. As a result, the information isn't fully leveraged.
• To be honest, our firm hires general business students and has never used the term BI or looked for it. Generally, such research, data, and analytical skills are very important for our work, so related coursework would be helpful for entry level consultants at our company.
• Too software-specific and too theoretical in their knowledge. Professional skills are often low.
• Transferring theory to practice.
• Translating academic pursuits into real-life application.
• Unfamiliarity with BI and BI-related topics. Unfamiliarity with business concepts (BI is about business, not about technology).
• We are interested in students with strong analytical skills, which is why we look to hire engineers, math majors, etc. But we also covet the communication skills that a business school applicant often offers. The biggest challenge in hiring a b-school applicant is the worry that their analytical skills (i.e. ability to synthesize data, create a process leading to a decision) will not match their strong communication skills.
• Work visas and finding more hands on experience.

How can universities better prepare students for BI careers?
• Offer more BI internships (or at least more hands-on BI projects in coursework). Continue emphasizing business and business-related topics in additional to technology topics.
• More internships in relevant areas, not just research projects; more courses around analytics and usage of Data Mining algorithms; and improve communication skills.
• A 50/50 class mix of business and technology. Internships.
• Adding BI specific content to courses and providing opportunity to BI research.
• Additional, specific courses in data modeling, ETL development, UNIX, SQL, and at least one reporting tool.
• Analytical skills and strong judgment.
• As a graduate of the Commerce School at UVA, I can personally attest to a need for greater data analysis and statistics. In order to be hired, I had to complete optimization problems and expected value equations. I hadn't even thought of these since high school. My company will teach its new hires all of the database information necessary for success, provided that students exhibit an ability to know what to do with the data.
• Assist with providing real life project work, preferably within a team environment.
• Bring in guest speakers, partner with enterprises to work on case studies, and develop projects with business applications.
• By having more hands-on class work in BI spaces, including delivery mechanisms.
• Case studies.
• Case Studies and projects.
• Communication skills and the ability to summarize what is important from the data. Many people can put reports into a spreadsheet. What separates the high performers is the ability to interpret the data and accurately present the findings.
• Continue to teach students skills that apply broadly in many areas. Broad business skills and analytical skills combined with technical aptitude will make someone successful later on in a BI job. Also, I don't hire anyone onto a BI team that doesn't have significant OLTP (not OLAP) but good Online...
Transactional Processing skills. Students need to live the basics of what it takes to successfully build and operate utility grade transaction systems before moving into the more theoretical world of BI.

- Create a balance of technical and business solutions with hands on experience.
- We need cross-functional students who can grasp the technology and communicate with business users.
- Cultivate less of a programmer/developer way of thinking and more of an agile, business-driven mindset. Ultimately, we’re looking for individuals who can bring additional value and insight out of our data in support of our business.
- Dedicate efforts towards contacting companies for student internships.
- Do not skimp on the communications/management coursework.
- Don't graduate people without good communication skills. My school had an English Language Proficiency Exam which weeded people out early. They could take extra classes and try it again, but after a certain number of attempts, it was evident that they didn't have the right skills.
- Encourage internships.
- Encourage students to take classes where they get hands-on learning of BI tools and methodologies of data warehousing.
- Ensure curriculum includes computing courses, advanced calculus, and statistics.
- Establish internships and/or partner on significant projects.
- Expand BI-specific internship opportunities. Create partnerships with organizations that use BI to run a day-to-day business in forms of clubs, user groups, conferences, and mutual research projects.
- Experience and projects are important.
- Expose students to a broad range of BI topics.
- Expose students to the "why" as opposed to just the "how."
- Focus on providing a well-rounded education and stress communication skills.
- Give them hands on experience.
- Give them more training in analytics ad related disciplines.
- Provide a global perspective.
- Provide hands-on experiences and internships.
- Hands-on exposure is important.
- Have them do some analytical work with large datasets.
- Have them help companies in the area with real-world BI problems. Make these class projects.
- Have them present project results to faculty and business leaders in ppt format. Have students explain their conclusions and the rationale for these. Probe them on what the numbers mean.
- I personally like internship programs where students can gain some practical business experience so they can apply their education to real world situations to gain valuable experience.
- Internships and being able to work on projects at real companies.
- Internships and hands-on classroom experience is a good way. Ensuring students have a mix of finance/accounting or other functional education as well as MIS foundational education is critical.
- Internships and real world experience.
- Internships are excellent – industry, consulting or BI software vendors are all good targets.
- Internships – as much hands-on experience as possible.
- Internships.
- Invite in the business community to provide consulting projects that student groups can complete. Teach them how to work in a professional environment (be part of a team, organizational skills, professionalism, etc).
• Logical reasoning - an understanding of basic business needs/realities, along with analysis skills and to be able to see the "big picture."
• Look for the companies that focus on BI so they can be matched up.
• Lots of hands-on experiences with newer technologies.
• Make sure they have solid SQL skills. After that, a positive inquiring attitude is the next most important.
• More capstone courses that are interdisciplinary – i.e., spelling counts on your math homework, developing spreadsheets to calculate the cost for marketing projects, error checking to find bugs in large Excel data sets and formulas.
• More class projects. More work with big data and appropriate data analysis techniques. Grade based on technique, not just outcomes.
• More database instruction and advanced SQL. More tying of statistics into other classes, so that it's not just taken once in a core course then forgotten.
• More internships or ways to gain that knowledge.
• More practical experience via internship and practice, and smaller initiatives with business applicability.
• More real world projects.
• More visibility with intern programs - get the students into a business environment to gain experience before graduation.
• Offer coursework that focuses on requirements gathering, creating functional and technical specifications for BI projects. Focus on data modeling for OLAP / ROLAP / MOLAP.
• Offer courses that focus on prototyping and case studies
• Offer more BI lab classes in fundamental data management, data architecture, data integration, and ETL.
• Partner with industry and business local to the university area to offer BI/Analytics internships.
• Prepare guidance material, or attune them to careers in BI.
• Project based learning -- case studies and integration of multiple techniques to get solutions.
• Projects and more hands-on software exposure.
• Projects and internships.
• Promoting internships.
• Provide a curriculum specific to BI. It would be a mix of business (Finance most important) and technical (Data, OLAP, etc.).
• Provide experienced-based education.
• Provide exposure to business, co-op, hands-on experiences.
• Provide more opportunities for students to gain experience in an actual business environment. Specifically, connect projects to actual businesses as much as possible so that IT/ BI students see it in broader context of a normal business (with its tradeoffs) instead of in a vacuum.
• Provide more project management skills especially for troubled projects and teach them business analysis so they know how to narrow down end user requirements so they get what they need.
• Provide more real-world cases and project work in this area.
• Provide more training on specific tools.
• Provide them with a broad level of experience and education.
• Real projects and internships.
• Real-world BI is messy. Messy data from many sources, constantly changing, no business model is straight forward or static, user questions are dynamic, and straight-forward solutions are cool for the first day and then almost immediately become out-dated.
• Real-world experiences. Focus on why firms have problems getting usable information out - not the bits and bytes of a particular toolset. Give them a good understanding of relational databases, the SQL
language, and the difference between OLTP data modeling and the de-normalization approaches of Kimball.

- Required internship or co-op program.
- SW vendors are more than willing to bring their SW into the university environment and provide training. It ultimately creates a demand for their product. However, I have seen very few take advantage of this.
- Students should be educated with solid business knowledge in order to design a B/I tool or provide B/I that is "actionable" and "measurable" for businesses.
- Teach and test on one or multiple theories (e.g., Kimball). The tool (e.g., Informatica, SSPS) mechanics are important but they need a foundation in design.
- Teach data modeling (star and snowflake schemas). Teach how business imperatives drive BI content. Teach SQL, SQL, SQL! Teach one or two BI tools and focus on business requirements. Teach how to translate business requirements into design objects. Teach Agile/Scrum methods for BI. Have them do a project, making sure they start with a business sponsor who will drive content and needs. Teach students how to communicate with business people in non-technical terms.
- Teach students the Key Performance Indicators for a given industry (e.g. Net Written Premium, Unearned Premium for Insurance).
- Teach them Excel, Power Pivot, and basic Pivot Table usage. Teach them basic database theory and how to use it in SQL server. Teach them, using MSSQL, basic data warehousing concepts. Introduce them to real datasets from accounting, sales, and marketing.
- Technical skills which are directly applicable to IT or business roles on projects: data modeling, BI software, software project life cycle, and finance or some business functional experience.
- They can offer basic skills and understanding in BI and how to articulate its value from a business side.
- To have a career in BI, I believe it is a "must" to have strong business acumen to go with the technical expertise. It is also important that these students come out of school understanding the need for business and IT to have a strong relationship, and they should be prepared to play a strong role in building those relationships. I believe too much focus on the technology without also focusing on business concepts and relationships is a bad thing.
- Training and teaching the key concepts that also include project assignments Then, allow students access to a research lab (virtual or on-site) where various DB & BI (ideal to be top vendors in the industry) technologies are readily available in order to acquire practical experience with new skills and knowledge.
- Understand emerging BI tools, internships, interpersonal and communication skills, and requirements gathering.
- Work with companies building and deploying BI solutions to the industry. Get real world problems they can bring to the class and work with the company in solving those.
- You can be a technical person or a business person but nothing happens unless you solve the business problem. Technology cannot do this, it takes people.

**Is there anything else to share?**

- At the undergraduate level all you can do is teach students BI vocabulary and some basic skills so they aren't completely blind-sided when they find themselves on a real implementation team. You cannot become a BI expert in a classroom - nor would I expect anyone to do that. Give me smart, curious people with HIGH technical aptitudes, and we will take it from there.
- BI cannot be thought about in isolation. It needs to be though in terms of the greater business process.
BI is too siloed by academic departments. The math/stats, econ, finance and IT/MIS departments need to partner to offer inter-disciplinary courses. Real business issues cross over all these areas.

BI positions are so hard to hire for because they require strong grounding in the hard technology married to strong analytical skills and judgment. Much of this cannot be taught, but it can be refined.

BI should be part of marketing research likely as a joint curriculum between IT and Marketing.

Business and presentation skills are becoming more important than technical skills.

Business need to make decision very fast, and business needs that intelligence to be built and get results quickly to make decisions.

Businesses are going through an exponential growth in having access to not only internal data but also external data. When making corporate business decisions, one must fully understand the state and accuracy of internal data points as well as how to leverage external data points in making these important decisions. Knowing what is available and how to manage its use would be beneficial for students.

I find academia is too caught up in buzzwords about BI versus providing simple pragmatic explanations (i.e., pervasive BI versus operational reporting).

I focus on the IS side of BI in some of my answers, but this discipline should be emphasized in managerial/strategy coursework as well.

I hire experienced BI professionals.

I think a BI Major would be fantastic for placement and a pre-condition for success in consulting, startups, IT, and/or key business functions in corporations. Students with that major should have coming out of college: analytical styles/methods/approaches; ability to translate/connect strategy --> objectives --> metrics --> calculations --> data transformation --> data sourcing; an understanding/survey of most common/important analytical applications by department/function (supply chain, HR, finance, marketing, etc.) and by industry (consumer goods, financial services, yield businesses, etc.); high-level knowledge of data architecture/strategies (Kimball, Inmon, ODS, DW, Marts, Cubes, master data, message bus/real-time); high-level knowledge of various categories of tools (RDBMS, MOLAP, ROLAP, ETL, Query/Reporting, Dashboards, Data Mining, etc.); some understanding/survey of the tools/vendors market - history, current, trends/forecast; specific skills in some tools (1 data, 1 front-end); and understanding of the anatomy, process, and critical success factors for a BI project (e.g. the business and data issues are much more difficult/critical than the tool, which people get hung up on).

I think there are fewer people out there with the technical skills to match their business background.

I think this is great that this is getting started. Teaching students "why" BI is important is the first skill they should learn - how companies make money and why BI plays a pivotal role. Smart grads can learn the technology, but what they need coming out of school is why the technology exists.

I'm glad to see more emphasis being put into BI as quantitative and analytical skills are important for a lot of companies, and BI skills are a good way to assess someone's quantitative and analytic ability.

Industry is changing rapidly with companies moving towards cloud computing, column-oriented, MPP databases and a strong focus on analytics. "The New Know" by Thornton May should be required reading.

It is exciting to hear that BI is an area of focus. Keep up the good work.

BI is in its infancy.

It’s a new area and few people have an idea of it. Universities are still focused on developing specialists without realizing that the business world needs more generalists at the entry level.

It's an exciting time to be learning BI. The skills are very portable.

Keep the academics in this area growing in order to align with demand. Also, market this field to more undergrad students. I wish I had some classes/experiences available to me when I was in school.
• Management seems to want dashboards above all else. People need training in the foundation of BI, not the buzzwords.

• Overall, it appears to be nearly non-existent in GA.

• Please make sure to drive home the point that BI supports business needs and helps propel the business forward. It must start with the business, be driven by the business, with active business participation along the way. Dispel the myth that BI is data driven - it's business driven!! There is a serious knowledge gap in how a business analyst gathers requirements for a BI project as opposed to a software development project. There is a serious knowledge gap in the proper methods for delivering BI solutions - the typical SDLC doesn't work very well and is typically a recipe for disaster. There are new and emerging methods for delivering BI projects such as Agile/Scrum BI. Lastly, the state of BI technology is shifting. Specifically, a new class of tools are emerging that allow us to model the business inside the tools and auto-generate databases, semantic layers and data dictionaries and ETL code. I believe these are here to stay, making the "programming" part of BI less important than understanding requirements definition, business modeling, and governance. We can always teach graduates a new tool. The foundation concepts and how to apply them are more important than experience with a specific tool. Lastly, there are 3 fundamental components that should be taught: Information delivery (business analysis, front-end tools, good user interface design, how to design dashboards, etc.); data Architecture (data quality, data modeling, data analysis); and data integration (ETL). All three are important. An individual can make a career in any one of the three areas.

• Please stress the development of technical skills, business acumen and communication abilities.

• Teach practice, not theory.

• Quick note on the survey: I was uncertain how to answer some of the questions. Often, previous experience with BI, BI software, and SQL are looked highly upon, but they are not pre-requisites. In those instances, I chose somewhat important as my response, because it does play a role, but does not tip the scales one way or the other.

• Students do appear to be continuing to come into the workplace more and more prepared. However, in the case of BI this trend HAS to continue. BI projects are typically smaller and require more expertise. It's harder to "hide" resources without the proper skills/experience on a BI project (as opposed to larger software development projects - e.g. ERP projects).

• Technology and tools are always changing. Classes can always be found on certain tools. The schools need to focus on the business aspect.

• The ideal candidates will have some exposure to a combination of (1) business function (i.e., finance), (2) specific technology (i.e., Oracle), (3) solution (i.e., data warehousing, reporting, data modeling), and (4) industry (i.e., media, insurance).

• The state of analytics in industry is more data gathering than actual analysis. As data management practices improve, analysts will need to be adept at drawing conclusions from the data then turning the insight into actionable recommendations.

• There is a general lack of available resources and classes, which delve into the available tools and resources available to analysts. As a business analyst, I'm excited to see new courses being developed by University of Washington to support the role, but I look forward to seeing more development in this area.

• There needs to be a better understanding of BI and its benefits before businesses will commit resources to this type of program on an ongoing basis.

• This is a very hot area, and I think that BI will assist students in finding roles in the near future.
• This is an in-demand occupational niche as more businesses try to drive value out of their significant IT investments, especially in data warehousing. Despite privacy and data security regulations becoming stricter, BI is a major focus for our organization.
• To better prepare for SQL, offer a course in set theory, which contains relational math concepts.
• User interface and ease of use should be a topic for students. Teach them how to efficiently translate requirements into usability and test their information is easy to understand and easy to use by end users who often are not software-savvy.
• We have been able to find and successfully hire some students who have turned out to be really good BI practitioners. It definitely can be done, but it would help if we didn’t have to hunt for these folks as hard as we do. It seems we get lucky finding them.
• We tend to hire MBA's and more generic skill-sets because BI and DW skills are not really taught in the universities we hire from. However if we had a college grad who understood SQL, ETL, BI Report Development, etc., we could get them busy on much more interesting work from the employee and profitable work for us.
• We’ve had great luck in hiring sharp young people (16 in the past 3 years).
• Work on practical problems or assignments.

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For more information about this survey, please contact Barbara Wixom, University of Virginia at bwixom@virginia.edu or Thilini Ariyachandra, Xavier University at ariyachandrat@xavier.edu.

Barbara H. Wixom is an associate professor of IT and director of the masters in the management of IT program in the McIntire School of Commerce at the University of Virginia.

Thilini Ariyachandra is an assistant professor of MIS in the Williams College of Business at Xavier University.