



SCHOOL OF INFORMATICS AND COMPUTING

INDIANA UNIVERSITY-PURDUE UNIVERSITY
Indianapolis

2014–2015 Program Review and Assessment Committee Report for the School of Informatics and Computing

The School of Informatics, IUPUI, offers a full range of academic programs, as listed below:

Undergraduate Programs

<i>Bachelor of Science Degree programs in</i>	<i>Certificates in</i>	<i>Minors in</i>
Health Information Management Informatics	Human-Computer Interaction Informatics	Informatics
Media Arts and Science	Legal Informatics	Studio Art & Technology
	Medical Coding	

Graduate Programs

<i>Master of Science Degree programs in</i>	<i>Graduate Certificates in</i>
Bioinformatics	Clinical Informatics
Data Analytics (starting fall 2016)	Public Health
Health Informatics	Health Information Management and Exchange
Human-Computer Interaction	Health Information Security
Library Science	Health Information Systems Architecture
Media Arts and Science	Human-Computer Interaction
Sport Analytics (starting fall 2016)	
<i>Doctor of Philosophy programs in</i>	<i>Doctor of Philosophy Minors in</i>
Bioinformatics	Bioinformatics
Health and Biomedical Informatics	Health Informatics
Human-Computer Interaction	Human-Computer Interaction

Accelerated Bachelor’s to Master’s Degree Programs

In the last year, the School has created the opportunity for students to follow accelerated five-year bachelor’s and master’s degree programs. The demand for informatics and computing professionals working in a variety of fields is growing rapidly. As a result, employers are seeking graduates with the qualifications and skills necessary to emerge as tomorrow’s technology leaders. The forward-thinking BS/MS programs combine in-demand degree offerings in an accelerated format, designed to prepare marketable and highly skilled graduates. Alumni of the BS/MS programs will be well-equipped not only for success in computing and information technology, but also the healthcare, science, business, interactive media, and design industries among others.

Within the School, a B.S. in Informatics student can move into the M.S. in Bioinformatics, Health Informatics, or Human-Computer Interaction. A B.S. in Health Information Management student can gain an M.S. in Health Informatics, and a Media Arts and Science student can move on to the M.S. in Human-

Computer Interaction. The school has also built relationships with other programs on campus for undergraduates to earn their master's in five years:

- B.S. Biology to M.S. Bioinformatics
- B.S. Health Sciences to M.S. Health Informatics
- B.S. Nursing to M.S. Health Informatics
- B.S. Sports Management to M.S. Sports Analytics

BioHealth Informatics Department:

1. Brief History of the Department

a. *Origin and significant events in its development.*

The BioHealth Informatics Department was founded on August 1, 2013, from the merger of three programs of the Indiana University School of Informatics: Health Information Management, Health Informatics, and Bioinformatics.

The Health Information Management (HIM) program began in 1950 as Health Information Administration (HIA), a part of the Allied Health division of the Indiana University School of Medicine. Allied Health later became an independent school on the IUPUI campus. In addition to the HIA faculty, the program has been supported by adjunct faculty, including health information management professionals, lawyers, doctors, and pharmacologists. In July 2002, Health Information Administration became an undergraduate degree program in the School of Informatics and in 2014, the program changed its name to Health Information Management to be consistent with the national association and industry norms. The program also made a transition to distance education around 2004, which changed the student demographic to more non-traditional and/or working students.

2. Mission and Goals

a. *Statement of mission, including relationship to school and campus missions.*

Health Information Management (HIM) professionals serve as a bridge between the clinical, operational, and administrative functions within the healthcare industry and directly affect the quality of patient care. Widespread adoption of new technologies has heightened the need for specialized HIM professionals able to manage electronic health records, analyze health information, and ensure the privacy and security of patient data. The HIM program incorporates medicine, management, finance, information technology, and law into one curriculum. Because of the diversity of the coursework, HIM graduates can choose from a variety of work settings across an array of healthcare environments.

b. *Goals in teaching and learning; research, scholarship, and creative activity; and civic engagement.*

It is the aspiration of the program director, faculty, and staff to continue to build a strong and diverse program by targeting certain populations of potential HIM students who want to graduate from an accredited program. Students from smaller schools and community colleges could be recruited more heavily to increase transfer enrollment to IUPUI's HIM program. Students with associate's degrees could either complete their final two years to graduate with a bachelor's degree or, if they meet the 3.25 GPA requirement, enroll in the 4+1 program to gain both a bachelor's and master's degree in only three years. The program

will continue to look for ways to build relationships with other programs to allow for a smooth transition for future transfer students.

It is also a goal for pass rates of HIM students for the Registered Health Information Administration (RHIA) examination to continue to increase. Current pass rates for IUPUI students have been increasing over the past few years and the goal in previous years was set at 90%. In the coming year, the goal is set at 95%, even though the national standard is only 75.8%. It is also the intent of this program to have all students take the examination before they graduate so they are prepared for full-time employment upon graduation. The HIM program will continue to have a decreasing Drop, Fail, Withdraw (DFW) rate and an increasing retention rate, which both directly impact the number of students earning their bachelor's in HIM within the state recommended timeframe of four years.

c. *External demand and campus needs for the program.*

The programs of the School of Informatics and Computing continue to be designed to meet current and emerging needs based on current healthcare and public health law, practice, and theory as it pertains to informatics. Representatives from local organizations involved in health informatics (such as the Regenstrief Institute) have played a key role in shaping the content of courses and the program overall.

- The Health Information Management (HIM) Program meets curriculum standards developed by its accrediting organization, the Council on Accreditation of Health Informatics and Health Information Education (CAHIIM).
- The Bureau of Labor Statistics forecasts a much faster than average growth for biomedical informatics careers including a 23% growth between 2012 and 2022 for Medical and Health Service Managers (US Bureau of Labor Statistics, May 2014).

The need for HIM professionals is growing with an extensive shortage projected to 2025. With the changes in the medical profession in information technology, electronic records, implementing the enterprise record, and ICD-10, even more positions will require the RHIA credential. The need for HIM professionals with a master's degree is also growing, and this program has built a bridge with the Health Informatics program to shorten the time to five years to complete both the BS in HIM and the MS in Health Informatics.

Human-Centered Computing Department:

1. Brief History of the Department

a. *Origin and significant events in its development.*

The Department of Human-Centered Computing (HCC) was founded on July 1, 2013 within the new Indiana University School of Informatics and Computing and includes Human-Computer Interaction (HCI), Media Arts and Science (MAS) and the Informatics undergraduate program. As the largest department in the IUPUI portion of the School, HCC is home to a dynamic and interdisciplinary community of faculty and students who bring together strong research and education expertise in informatics, emerging media, and HCI to advance interdisciplinary research at the forefront of human-centered computing.

When the School of Informatics was founded in 2001, it was Indiana University's first completely new school in 28 years and the first program in the nation to offer a Ph.D. in Informatics. As the first School of Informatics in the United States and the second School of Informatics in the world, the program has been able to chart a course for what an undergraduate degree in Informatics should look like. The program has created courses and other learning opportunities that prepare students for satisfying careers that blend information technology skills with knowledge in particular disciplines. The philosophy behind the establishment of the degrees back in 2000 was that they be interdisciplinary. At that time, it was planned to be a "virtual school" with no full-time faculty and teaching provided by faculty in other schools on campus. From this standpoint, it is clear how quickly the school evolved to now having excellent facilities in a building devoted to information technology, having a cadre of full-time and adjunct faculty bringing a diversity of talents and expertise, an excellent staff, and a supportive community that includes a variety of advisory councils and boards.

2. Mission and Goals

a. *Statement of mission, including relationship to school and campus missions.*

The Indiana University School of Informatics and Computing, IUPUI, has set as its goal to be nationally recognized as among the foremost in the country in excellence and leadership. A great need and opportunity exists for professionals trained in state-of-the-art information technology and science with an emphasis on creative human applications. An urgent societal need also exists for graduates with education and experience in informatics—particularly those with interdisciplinary skills. The school will graduate professionals with formal preparation in information technology (IT) combined with subject area expertise. To this end, the school will

- Lead the nation in the development of an innovative and successful new curriculum for information technology (IT) and its applications.
- Educate students, including those who might not traditionally consider an educational path in technology, especially women and minorities.
- Encourage interdisciplinary research projects in the field of Informatics, focusing on distributed systems technology, information theory and information management, human factors and human-computer interaction, and the study of the social impacts of information technology.
- Serve the state of Indiana by way of education, community, participation, and collaborative research partnerships, thereby participating in the growth of an IT culture in the State, and encouraging continued economic development.
- Produce graduates who become leaders in the growing information economy of Indiana and the world.
- Develop synergistic relationships with industry to develop and advance research in information technology and its applications.

b. *Goals in teaching and learning; research, scholarship, and creative activity; and civic engagement.*

Four areas of strategic growth have been identified, encompassing the education, research and service mission: undergraduate programs; graduate programs; research; innovation

and entrepreneurship; and diversity and civic engagement. For undergraduate programs, the department would like to increase enrollment, increase the quality of admitted students and maximize retention and graduation. For the graduate programs, there should be an increase in research productivity for students, improvement on the quality and quantity of students, and embedding of industrial partners and career the pipelines in the graduate programs. The department would also like to facilitate execution of the research commercialization cycle, innovation, and entrepreneurship; increase civically engaged research and community outreach; and maximize effort to recruit a diverse student population.

The Informatics undergraduate program has also been working on an initiative that should be coming to fruition soon. Indiana University has embraced online education with the establishment of IU Online, with the University's President deploying significant resources and setting up an entire new university unit to guide this effort. The school has submitted a proposal for an online Bachelor of Science in Informatics that would be a cooperative effort with the regional campuses. The school's most significant contribution to this program is that many courses are already being offered online, some of which are unique, that can be part of the consolidated curriculum.

c. External demand and campus needs for the program.

The stature and visibility of Informatics has been increasing on campus and within the university due to a number of factors. First, eight 100- and 200-level courses in the HCC department are now included as part of the general education offerings that can be taken by any student to fulfill his/her general education requirements. This has not only boosted enrollment, but has also given more students the opportunity to be introduced to informatics as a potential career option. Several accelerated five-year BS/MS programs were also developed, which will attract and retain high achieving students to the undergraduate degree. The department has built relationships with other schools on campus to craft joint BS/MS programs that can be completed more expediently than pursuing each degree separately. For example, a proposal for a Bachelor's degree in Informatics with a Master's of Jurisprudence (MJ) from the McKinney School of Law is being circulated. There are very few MJ programs in the United States and its flexibility nicely complements the undergraduate Informatics curriculum, particularly if the student chooses Legal Informatics as an area of specialization. Other joint degrees and certificates currently being created include a certificate on cybersecurity with the School of Public and Environmental Affairs (SPEA).

Library Information Sciences Department:

1. Brief History of the Department

a. *Origin and significant events in its development.*

The Department of Library and Information Science (LIS) has offered a Master of Library Science degree, accredited by the American Library Association, since 2000, when it was an independent school. From 2004–2006, the program created the Shapingoutcomes.org learning resource, along with the museum studies program, a \$1,000,000 contract from The Federal Institute of Museum and Library Services. From 2007–2011, LIS received grants for diversity and for career transitions leadership programs and in 2012–2013, the program changed from a two-way television (Virtual Indiana Classroom) to an all-online program. On July 1, 2013, the School of Informatics officially merged with the School of Library and

Information Sciences under the name School of Informatics and Computing. A departmental structure, which had not been present in the school previously, was established.

2. Mission and Goals

a. *Statement of mission, including relationship to school and campus missions.*

Library and information professionals enable individuals and communities to meet their information needs now and into their future. The LIS department supports aspiring library and information science professionals to obtain up-to-date skills, a future orientation, and a professional mindset; teaching is engaging, innovative, and primarily uses online methods; faculty and student community service positively impact the profession, in Indiana and nationally; and research advances knowledge of the transformative power of effective information management for public libraries, open access, digital heritage, and library administration.

The LIS department is the place where

- Aspiring library and information science professionals gain current skills, a future orientation, and a professional mindset.
- Teaching is engaging and innovative, primarily using distance education methods.
- Faculty and student service transforms the profession, in Indiana and beyond.
- Research advances knowledge in how information and effective information management changes lives, particularly, but not exclusively for public libraries, open access and changing academic information flows, community and scholarly memory, and library leadership.

b. *Goals in teaching and learning; research, scholarship, and creative activity; and civic engagement.*

The LIS department at present serves only master's-level students. During the next one to three years, the department anticipates developing student enrollments in undergraduate courses related to cultural heritage, information organization, and digital libraries and archives. In three to ten years, the program will develop a doctoral-level program. The school will continue to collaborate with other departments across campus to develop specializations. Areas in which we can create a distinctive national reputation include public libraries, especially in community engagement (an IUPUI specialty), digital archives, and continuing professional education to be delivered online.

c. *External demand and campus needs for the program.*

Nationally, the demand for librarians varies according to the economy.

Purposes, Reputation, and Aspirations of the Health Information Management Undergraduate Program:

1. Reputation

a. *Estimate of the program's national ranking based upon numbers of graduates, subsequent placement of graduates, level of support, or other criteria appropriate to the discipline.*

The Health Information Management program at IUPUI is one of the strongest and most stable programs in the country. The Commission on Accreditation of Health Informatics and Information Management (CAHIIM) does not support a national ranking for HIM

programs. However, CAHIIM holds IUPUI as one of the original schools. With the program's current pass rate of 90.9%, the curriculum and the program are extremely effective, well above the 75.8% (2014) exam pass rate nationally. IUPUI has graduated over 570 students, including 29 in May.

The best measure to use in determining the reputation of a school is the success of the students in securing internships and graduates in securing full-time positions at prominent organizations. HIM graduates are in high demand by the top organizations in the industry, including Ascension Health, Community Health Network, Franciscan Alliance, Inc., and IU Health. These organizations represent the four large hospital networks in the Indianapolis area and repeatedly hire RHIA certified graduates of the program into various departments.

Program Processes:

2. Program Content

a. *Distinctive characteristics.*

IUPUI's Health Information Management program has secured Practicum Professional sites for students to participate in during their last year of classes. Practicum students work on-site on a weekly basis to earn a year of professional experience before they complete the degree. They also take classes in ICD-9-CM coding and receive extensive education in ICD-10, both PCS and CM, which gives students yet another area of specialty. To separate this program from others, the HIM program has experienced instructors that all have different areas of specialty. This gives the students a well-rounded experience.

Curriculum analysis and revision is based on Commission on Accreditation of Informatics and Information Management Education (CAHIIM) accreditation and the Model Curriculum put in place by the American Health Information Management Association (AHIMA). In 2014, the interim program director, associate Dean of Academic of Academic Affairs, and academic advisors worked closely with the HIM faculty to create a proposal to review various aspects of the HIM program. Multiple courses were renumbered, renamed, and their course content revised. These improvements were made to ensure the students are learning the level of HIM material needed to pass the RHIA examination, as well as obtain a full-time job in the HIM field upon graduation.

b. *Structure, breadth, and depth of program.*

This program is very structured and courses must be taken in a specific order. The plan of study is set up with many prerequisite courses, and students are meant to take certain groupings of courses to ensure the student is given a solid foundation before moving on to the next section of coursework. The introductory class gives a basic overview of the program, but as the students progress, courses become specialized to ensure that the student will be prepared in the area they are interested in pursuing when they finish the degree. Each class has a specific measure to meet to make sure the student has the knowledge to build from. In the past, the HIM department had its own grading scale separate from programs across campus, but has since adopted the University grading scale to minimize confusion. The curriculum is intensive, and there is little room for electives or exploratory courses.

Students learn basic math and, by the end of the program, are able to perform statistical analysis. English composition is required and students gain additional skills in writing for both business and healthcare settings. Beginning coursework focuses on legal policy, and the topic continues throughout the program, covering both state and federal policy. While the program starts with basic concepts, knowledge builds with each course to prepare students for the national exam.

c. *Interdisciplinary program offerings.*

HIM has a strong interdisciplinary program within the areas of information technology and health information management, which gives students more areas of specialization to choose from. With the education that is provided in this program, they have the options to explore IT auditing, securities, and even IT database assistance. There are also interdisciplinary options in the legal and health information management area, enabling students to work in risk management, quality assurance, or assist on legal teams. To give students another area of expertise, a minor in Public Health is planned.

d. *Desired learning outcomes for students.*

The HIM degree has 102 student learning outcomes divided into the following six domains: Data Content, Structure & Standards (Information Governance); Information Protection: Access, Disclosure, Archival, Privacy & Security; Informatics, Analytics and Data Use; Revenue Management; Compliance; and Leadership. The student learning outcomes are listed in the “Baccalaureate Level HIM Curriculum Map.” See Appendix A for learning outcomes.

Learning outcomes are assessed through an analysis of the RHIA exam scores, which provide a detailed breakdown, and are sent to the program director on a quarterly basis. They are also assessed through regular course content assessments performed by the HIM faculty and professional practicum instructor. This annual assessment is a requirement for CAHIIM accreditation.

e. *How has the department curriculum responded to new directions in the discipline?*

Since HIM is a continuously evolving field, the curriculum has recently been adjusted to meet the new direction that the discipline has taken, and will continue to adjust to meet the needs of the students. Over the past few years, the need for students to have strong software skills has extended to strong database skills. Before these changes, there was the shift from paper records to electronic records.

There has also been a shift from the ICD-9 coding system to ICD-10 coding system. As of October 1, 2015, students receive training in both systems. Currently, there is also a Medical Coding Certificate that prepares students for entry-level positions. Its classes transfer into the HIM degree.

f. *Curricular philosophy*

The philosophy behind the HIM program is to prepare students to play a strong role in the healthcare information field at all levels, both inside and outside of hospital settings. To

give the students another area of experience and ability, the option of a minor for public health is currently being planned.

The practicum sites have been expanded beyond the traditional acute care hospital setting. Students are now placed in a wide range of health information practicums, including software development, insurance, home healthcare, coding audit systems, physician practices, and specialty surgical facilities. This change allows students to have broader real-world experience, which should translate into a wider pool of job opportunities upon graduation.

Purposes, Reputation, and Aspirations of the Informatics Undergraduate Program

2. Reputation

- a. *Estimate of the program's national ranking based upon numbers of graduates, subsequent placement of graduates, level of support, or other criteria appropriate to the discipline.*

The Bachelor's degree in Informatics continues to be one of the few undergraduate programs focused entirely on the general study of informatics versus other universities and colleges, which typically have programs focusing on subcategories of informatics. For example, Northern Kentucky University has Bachelor's degree in Business Informatics and Western Governors University has a Bachelor's in Health Informatics, making IUPUI one of the few that offer multiple areas of specialization within the field.

With informatics being a discipline still in its infancy, there are not national rankings or professional standards yet to determine the quality of the school and its programs. Even with the setting of professional standards, the School of Informatics and Computing (SoIC) at IUPUI would be difficult to rate based solely on those standards due to the breadth and types of programs offered that go beyond informatics.

Placement data for 2012-2013 and 2013-2014 show that graduates of the undergraduate degree in Informatics enjoy considerable success in job placement, including an average of \$52,800. Titles of the positions that some Informatics students have been able to secure include IT Developer, Technology Analyst, IT Consultant, Software Developer, Systems Engineer, Web and CRM Project Manager, Cloud Support Associate, Data Analyst, Technology Analyst and App Developer Analyst. Employers of IUPUI Informatics students include Accel Consulting, LLC, Amazon Web Services, Apparatus, Appirio, Asphalt Materials, Beyond Payroll LLC, CNA Insurance, ExactTarget, Interactive Intelligence, MasterCard, MOBI Wireless Management and Sogeti. Although many of these positions are located in Indianapolis, several successful and highly motivated graduates have relocated to Seattle, Chicago, and St. Louis. Graduates of this program are in demand by both local and national organizations for their unique combination of information technology-related skills. Increasingly, these organizations are employing students first as interns and then offering them full-time positions upon graduation.

Program Processes:

1. Program Content

- a. *Distinctive characteristics.*

Informatics students learn skills that allow them to harness the power of computing to solve real problems that directly impact the lives of others. They use their technology and problem-solving skills to make a difference in the world. For students interested in a career with great potential, informatics stands out as a strong, flexible, and dynamic field of study.

A significant aspect of the curriculum is the many opportunities for students to get involved in research projects, to contribute to community projects through COMET laboratory (a center developed to receive projects from community partners) and through work with local high schools and middle schools and to study abroad, particularly through the department's summer course in Paros, Greece. Faculty, staff, and students are active in the life of the campus, engaging in everything from the Regatta and days of service to being part of governance bodies, task forces, and committees.

Another unique feature of the Informatics program is that many of the courses are offered online. On a non-traditional campus such as IUPUI, the flexibility offered to students is an attractive recruitment and retention feature.

b. *Structure, breadth, and depth of program.*

The Informatics program is especially significant because of a number of features of the curriculum. All students complete a thesis, capstone project, or internship, providing real-world, hands-on opportunities to conduct research, to engage with the community and to build a professional portfolio. This is a great way for students to combine all the knowledge gained from previous coursework and present it within their area of specialization. Students take an applied research course to better prepare them for their thesis or capstone project and/or as preparation for graduate school.

Students also take career courses that help them hone their goals, interests and aptitudes and then identify the appropriate courses to take within the plan of study. These career courses also include such practical activities as preparing resumes and cover letters, job searching and interviewing skills, and how to obtain internships. The combination of career courses and a final project helps students to prepare for opportunities after graduation.

The school also offers several areas of specialization that provide domain-centric knowledge and IT skills that are targeted to meet the needs of particular professions. These areas of specialization are Health Science, Human-Computer Interaction, Legal Informatics, and Media Arts and Science (with several different tracks available).

c. *Interdisciplinary program offerings.*

All students select an "area of specialization" that provides them with knowledge of a particular discipline. Students are allowed to select from a wide variety of areas of specialization, including recognized minors and certificates offered through other schools on campus. These areas of specialization have been an opportunity for the school to partner with other schools on campus to craft a program that will meet the unique needs of students who want to apply their technology skills within a particular domain or discipline. For example, a popular combination is for students to earn a degree in Informatics with a minor in Business from the prestigious Kelley School of Business. Because of the areas of specialization, the degree is interdisciplinary by design.

The Human-Centered Computing department also contributes to the richness of academic offerings on campus through Informatics minors and certificates. Students at IUPUI pursuing other undergraduate degrees who want to add informatics and IT skills can earn a minor in Informatics, a certificate in Informatics, a certificate in Legal Informatics, which is entirely online, or a certificate in Human-Computer Interaction. Students pursuing a certificate in Paralegal Studies can simultaneously earn their Legal Informatics certificate with a reduced number of credit hours.

d. *Desired learning outcomes for students.*

The Bachelor of Science in Informatics degree develops skills and knowledge in information concepts and related information technology contexts with the purpose of preparing students to design, develop, and deploy processes involving computerization for acquiring and managing relevant data in making informed decisions. Focused on applied research and application, the degree is oriented toward professional practice and relies on a theory base drawn from fundamental disciplines that have application to informatics. Skills and knowledge embedded in this degree program include a technical understanding of how computing systems operate, the ability to adapt/assess and apply new trends in IT, well-developed problem-solving skills, the ability to work in teams such as those formed for the senior capstone project, well-developed communications skills to clearly convey solutions and observations to others, and an understanding of social and ethical principles as they relate to IT issues. These valuable skills can be transported to a number of job settings. See Appendix A for the list of learning outcomes.

e. *How has the department curriculum responded to new directions in the discipline?*

The Informatics plan of study has been revised significantly in the past 15 years. For example, in the early years, the degree tended to be light on the number of credit hours taken within the school versus general courses and electives taken from other schools. This was revised in the mid-2000s to bring more credit hours “in house” and to strengthen the technology component of the curriculum. Also, in response to employer feedback that indicated a need for students to have soft skills in addition to IT skills and domain-specific knowledge, courses in project management, ethics, and research were added. The use of group projects and experiential learning was also encouraged, for example, through community outreach courses (e.g., *Informatics for Social Change*). In 2014-2015, the plan of study was revised again to provide more rigor and increased technology content. New courses added to the required core are *Data Fluency* and *Web Services in Information Systems*. Although an entrepreneurship course has been offered since 2003, a team has been asked to develop a five-course certificate in Entrepreneurship, as well as a white paper showing other entrepreneurship activities that could be offered to students.

The department has been able to respond very quickly to the changing needs of the marketplace, based on feedback from employers and careful review of any information that suggests the skills and expertise that will be needed in the future. A theme for Informatics in the upcoming years will be adding more courses in data analytics, “big data,” security, and cloud computing. Information governance was identified as an increasing need in the marketplace, with a prediction that career opportunities will increase significantly, so a new online course has been added on information governance this semester. It is very clear that the top priority in establishing and revising the Bachelor’s in Informatics and the other undergraduate Informatics programs and courses is for students to have the skills they need for a successful career.

f. *Curricular philosophy*

The plan of study, especially vis-à-vis the core courses, electives and areas of specialization have been in response to industry needs, the increasing expertise of faculty and the emerging discipline that is informatics, which is broadly defined and still evolving. For example, the plan of study has been revised to add soft skills like project management, applied research and ethics, as well as to add more in-depth, rich-technology content in such areas as data analytics and cloud computing. In terms of the Informatics minor and certificate, the intent was to provide students in other disciplines with the opportunity to add informatics and IT-related skill sets to their major and career interests.

Purposes, Reputation, and Aspirations of the Media Arts and Science Undergraduate Program

1. Reputation

- a. *Estimate of the program's national ranking based upon numbers of graduates, subsequent placement of graduates, level of support, or other criteria appropriate to the discipline.*

The breadth of the MAS program is reflected in the diversity of organizations that hire graduates. Organizations ranging from animation, cloud services, education, entertainment, search, and telecommunications are a small representation of the types of organizations that hire MAS graduates with specialized skillsets and talents. Some current employers of MAS students are Evanced Solutions, Google, McGraw-Hill Higher Education, Pearson Education, Pixar, Salesforce, Telamon, and Warner Music Group.

Program Processes:

1. Program Content

- a. *Distinctive characteristics.* The focus of Media Arts and Science (MAS) is on creativity and digital storytelling while enhancing contemporary career-building skills. Our program offers education and experience on various integrated media venues in today's convergent society. Students produce dynamic websites, smartphone apps, interactive education, serious and entertaining games and simulations, 3D motion graphics, digital illustrations and animations, and audio and video. The program is designed to be flexible, with the opportunity to concentrate or broaden studies in one more specialty tracks. Specializations include 3D graphics and animation; digital storytelling; game design and development; video production and sound design; and web design and development. When a student completes a specialization, it will be listed on the diploma as such.

- b. *Structure, breadth, and depth of program.*

The Bachelor of Science in Media Arts and Science focuses on applied research and application, is oriented toward professional practice, and relies on a theory base drawn from disciplines that study communication as sight, sound, and motion. Skills and knowledge embedded in this degree program include web, mobile, and multimedia design, web and mobile computer programming, multimedia authoring language skills, multimedia implementation of audio and video materials, digital graphics (photography, scanning), and the writing and editing of materials for multimedia story boarding and content. Students learn to develop a website from scratch with knowledge of all elements required for development, operational support and security; develop programs in

languages on multiple computer platforms; prepare and present a major project with industry-standard documentation; plan projects; allocate and budget resources; and practice with an understanding of ethical, legal and regulatory considerations.

Once students take the foundational courses in both technical and creative venues, they choose a specialization, becoming fluent in the use of contemporary media tools and project management principles. A specialization gives the opportunity to customize a student's education in those aspects of media and production best suited for their career goals. MAS students take two career-specific courses; one course focusing on resume-building, cover letters and job shadowing, and the other focused on portfolio development. In preparation for their capstone, the final wrap-up of a student's educational experience, students take multimedia project development to learn about product planning and design, timelines, and project management tools to enable students to develop a project plan for the capstone.

c. *Interdisciplinary program offerings.*

The undergraduate degree has a 4+1 option with the M.S. in Human-Computer Interaction where students apply the latest research and principles of design, psychology, business, engineering, and computing to create breakthrough, innovative and human-centered interactive technology. MAS also has an 18-credit Studio Art and Technology minor offered jointly with the IU Herron School of Art and Design that combines courses from Media Arts and Science, Fine Arts, and Visual Communication Design. SoIC students are introduced to and become proficient with a wide variety of skills related to drawing techniques, design thinking, artistic and visual forms, and visual communication design that complement the cutting-edge technology and digital media design and production courses in the MAS program.

d. *Desired learning outcomes for students.*

The MAS program has 10 major learning outcomes for undergraduate students that can be found in Appendix A.

e. *How has the department curriculum responded to new directions in the discipline?*

In 2013, the Associate Dean for Academic Affairs observed that the BS in Media Arts and Science lacked clear progressions through courses that build on each other to competencies required for specific job positions. The alumni careers data, which Career Services had begun to gather, showed that some students were unable to find jobs in their major after graduation. Typically, these students simply went through the program taking whatever course interested them, because there were no specific requirements beyond taking a minimum number of upper-level courses in the MAS major. Although the major had informal areas of specialization, course progressions leading to employability in the major were not clearly specified. Where course progressions existed, they were obscured by inconsistent course titles.

The HCC Chair initiated faculty committees to the five areas of specialization and this effort enabled faculty teaching within each of these areas to carefully examine the curriculum and the relation between courses. The faculty began to redesign the curriculum accordingly. Specifically, the faculty identified job positions associated with each of the five areas, and competency areas and student learning outcomes required for those job

positions. This led the faculty to redesign existing courses and propose new courses. The Associate Dean worked with the MAS faculty to renumber and rename many of the undergraduate courses to make course progressions clear. For example, the sequence Multimedia Authoring Tools, Multimedia Content Management, and Online Document Development was given consistent names, Introduction to Multi-Device Web Development, Intermediate Multi-Device Web Development, Advanced Multi-Device Web Development and consistent numbers, N115, N215, and N315.

The faculty also identified among students a lack of artistic design skills required of practitioners in their intended fields (e.g., web design, game design, 3D animation). To avoid course duplication, the faculty and HCC Chair collaborated with the Herron School of Art and Design in creating a Studio Art and Technology minor, which enables MAS students to receive recognition for taking drawing, sculpture, and other art-related courses as well as enabling Herron students to receive recognition for taking technology-related courses from the MAS program. The minor was approved in spring 2015.

Although the five majors have not yet been formally proposed, with faculty approval the Associate Dean renamed specializations within the BS in MAS that had become obsolete and fallen into disuse more than a decade prior to correspond to the titles of the five majors. The renamed specializations were made transcriptable upon graduation, so potential employers could verify them from the final transcript and the specializations first appeared on the transcripts of the graduating class of May 2015. The faculty continues to consider the merits of separate majors, which show expertise in a narrower area but may make it more difficult for a student to transition into a new area and also might smack of a trade school rather than the program's broader curriculum, which includes a general education core and in media arts and science core. Nevertheless, the specializations provide a useful springboard for designing minors and certificates in these five areas. The HCC Department plans on proposing at least one minor and certificate in the 2015-2016 academic year.

f. Curricular philosophy

The philosophy has shifted from encouraging students to indulge their interests to a curriculum that can support employment in a major. The design of majors that support career aspirations has been a major emphasis of the Indiana State government and the Indiana Commission for Higher Education. Given that media arts and science encompasses fields that are firmly rooted in technology and the unfilled demand for employees in many technology sectors, it is generally expected that students will be employed in a major upon graduation. The response to the change in philosophy extends beyond the redesign of the curriculum and the establishment of five specializations. Engagement with industrial partners with respect to student internships, capstones, and project and portfolio critiques has increased as has interaction with the HCC department's Advisory Board.

The program has set the goal of 100% employment in a major for its graduates. A major impediment to achieving this goal for students in the Game Design and Development specialization is that jobs are typically out of state, and students are often reluctant to leave Indiana. A number of solutions have been proposed, including out-of-state internships and the incorporation of more skills in web and mobile software development, user experience design, and entrepreneurship in the game specialization. There is also concern that as the

number of graduates in the 3D Graphics and Animation specialization grows, Central Indiana may reach market saturation. To address this concern, advanced niche courses have been added, targeting the application of 3D technologies to new areas, such as the use of 3D prototyping and printing in medicine and dentistry.

Purposes, Reputation, and Aspirations of the Bioinformatics Graduate Program

1. Reputation

- a. *Estimate of the program's national ranking based upon numbers of graduates, subsequent placement of graduates, level of support, or other criteria appropriate to the discipline.*

The currently nationwide ranking for Bioinformatics is not available. The 2015 report of Best Colleges–Biomedical Informatics provided the program a 51 smart score and estimated the admission rate at 70% (<http://colleges.startclass.com/d/o/Medical-Informatics>).

Bioinformatics graduates are securing positions at some of the most recognized research organizations across industries in the world. Students are securing jobs at the Center for Disease Control, Dow AgroSciences, Eli Lilly and Company, IU School of Medicine, Mayo Clinic, and Sigma-Aldrich. The combination of research skills and ability to work with large volumes of data are in high demand.

The Bioinformatics program at IUPUI guarantees a full-tuition scholarship to its PhD students and a partial stipend to its full-time master's students.

Program Processes:

1. Program Content

- a. *Distinctive characteristics.*

Bioinformatics is a discipline with such tremendous impact that further research exploration in the area is fully supported by the Indiana University Life Science Initiative, Indiana's own Bioscience Initiative and Indiana Genomics Initiative (INGEN). The program is known for its internationally renowned faculty, its personalized courses, where students learn from approachable faculty, and for its industry connections with biopharmaceutical partners, such as Eli Lilly, Dow Agro, and others, which offer students opportunities for internships, sponsorship, and collaborative research. The IU School of Medicine, Regenstrief Institute, IU Simon Cancer Center, Center for Computational Biology and Bioinformatics, and other research centers make IUPUI a leader in cross-disciplinary research.

- b. *Structure, breadth, and depth of program.*

The Master of Science in Bioinformatics is a 36-credit-hour program that integrates knowledge from informatics, computer science, information systems, mathematics, biology, and related areas to create and implement applications that improve health outcomes. The program may be completed in two years by a full-time student, while part-time study options are available for domestic students. International students and any students funded directly by the School of Informatics and Computing (in the form of an assistantship or fellowship) must complete the program in two years.

The PhD in Informatics with a Bioinformatics specialization is a 90-credit-hour program that integrates knowledge from informatics, computation, information systems, mathematics, biology, and related areas. The program includes core courses, research rotations, a choice of minor, qualifying examinations, and a dissertation. Upon matriculation, students become immersed in groundbreaking research under the guidance of renowned faculty. As part of course projects, independent research investigations, and lab rotations, students learn to use informatics, computer science, statistics, the life sciences, molecular biology, genetics, and a host of other disciplines to create and implement computational tools and applications that improve health outcomes.

The PhD minor in Bioinformatics is to lay a foundation in bioinformatics knowledge, methods, and techniques to solve biological problems for current PhD students from other disciplines at IUPUI. This minor will assist graduate students with a background in biology, computer science, or another basic science to gain additional interdisciplinary training that is useful for research in their own discipline.

c. *Interdisciplinary program offerings.*

Bioinformatics is inherently an interdisciplinary field between Computing and Biology. The program offers courses in programming, databases, machine learning, statistics in bioinformatics, genomics, proteomics, next generation sequencing, big data analytics, system biology, and others interdisciplinary courses. Bioinformatics offers accelerated programs with the B.S. degrees in Informatics and Biology.

d. *Desired learning outcomes for students.*

See Appendix A for the learning outcomes for Bioinformatics.

e. *How has the department curriculum responded to new directions in the discipline?*

Bioinformatics is a dynamic field with new challenges emerging constantly, and the curriculum strives to embrace these challenges. Consulting and advising from industrial partners are continuously sought and new courses are created and designed for addressing the needs for emerging issues. Faculty with unique areas of specialization are being recruited and existing courses are often redesigned to ensure up-to-date content. In addition, short training programs are developed to reflect new directions in the field.

f. *Curricular philosophy*

Bioinformatics focuses on translational research that uses computational means to transform biological data into discoveries that help us better understand and improve life.

Purposes, Reputation, and Aspirations of the Health Informatics Graduate Program

1. Reputation

a. *Estimate of the program's national ranking based upon numbers of graduates, subsequent placement of graduates, level of support, or other criteria appropriate to the discipline.*

While no nationwide ranking system currently exists for graduate programs in health informatics, the Health Informatics program at IUPUI is one of the largest in the nation by

enrollment and research productivity. *US News & World Report* ranks several closely associated graduate and professional departments present on the IUPUI campus. Associated IUPUI graduate departments that score in the *US News* nationwide Top 150 rankings include Nursing (#19), Research Medicine (#45), Clinical Psychology (#79), Psychology (#92), and Biomedical Engineering (#124). Students have performed research with faculty in these departments at IUPUI and some Health Informatics faculty hold adjunct appointments in these departments.

From 2009–2014, the reported average job placement rates or continuing education (within six months) was 91% and the average job salary is \$63,416, compared with an average of \$69,000 for all graduate Health Information programs in the United States.¹ Health Informatics graduates are currently working at Ascension Health, Community Health Network, Franciscan Alliance, Inc., Indiana Health Information Exchange, IU Health, IU School of Medicine, Regenstrief Institute, UnitedHealth Group, and Wellpoint. Graduates of Health Informatics are at the forefront of health and health-related organizations leading them through the implementation of software and technology to advance the quality of healthcare and increase the cost effectiveness of providing health-related services.

Unlike many other Health Informatics programs, IUPUI's program offers a guaranteed full tuition scholarship and a stipend to all fall-admitted full-time M.S. and PhD students. The stipend offered to students (between \$18,000 and \$22,000 per year) provides a living wage in the Indianapolis area. The PhD total compensation package also includes zero-premium health insurance.

Program Processes:

1. Program Content

a. *Distinctive characteristics.*

The program is distinct in that it follows an extremely multidisciplinary approach to health informatics and the management of health information. Courses offered within the department range from statistical health analytics to organizational health information studies. The program is known for its significant volume of research. The research labs offer study opportunities in fields ranging from advanced data mining to information technology user experience design.

b. *Structure, breadth, and depth of program.*

The curriculum for the master-level courses emphasizes a great depth in health informatics to support and deliver health care, nonetheless, breadth is also of high quality due to the scope of courses taught in the BioHealth Informatics department. The curriculum is structured so that students learn the foundations of health informatics prior to proceeding to more advanced courses in clinical decision support, electronic health records (EHR) design, healthcare business, health information exchange, and healthcare analytics. For PhD students, further breadth is provided by the more research-focused courses on health

¹ *US News*, <http://www.usnews.com/education/best-graduate-schools/articles/2014/03/26/consider-pursuing-a-career-in-health-informatics?page=2>.

informatics and the requirement of a minor. PhD students must also complete extensive research experience activities including two research rotations and a full dissertation.

c. *Interdisciplinary program offerings.*

The department offers courses reflecting the interdisciplinary nature of the health informatics field. Several courses emphasize the analysis and evaluation of qualitative and quantitative data, while others examine the social aspects of health information. Other courses are technical with content grounded in interdisciplinary systems design. The PhD minor is taken in programs of the BioHealth Informatics department, and students must work with advisors from across the campus to ensure they complete the requirements to receive the minor.

The Health Informatics M.S. degree can be earned in five years through 4+1 agreements with undergraduate degrees in Health Information Management and Informatics within SoIC or Health Sciences and Nursing outside of the department.

d. *Desired learning outcomes for students.*

See Appendix A for Health Informatics' learning outcomes.

e. *How has the department curriculum responded to new directions in the discipline?*

Health informatics is a rapidly changing field and the IUPUI Health Informatics curriculum strives to embrace these changes. New courses addressing changes in the field are consistently offered each semester via the workshop/topic series. The core courses are also frequently updated to reflect new topics within their respective domains of knowledge. Curricular redesign is planned to structure the curriculum in one-credit modules to diversify the offerings. Through this redesign, we will accomplish the following objectives: establish flexible training programs from the existing curriculum to prepare a skilled workforce in HIT and Meaningful Use; provide flexible curriculum delivery ranging from classroom and laboratory to on-the-job training, from contiguous to virtual meeting times; and generate planned programs made up of different units fluctuating from one-credit modules towards a one-year graduate certificate (18 credits) or a two-year M.S. (36 credits) from Indiana University.

f. *Curricular philosophy*

The Health Informatics program unifies the faculty and researchers from different academic units from IUPUI to work under the unifying umbrella of health informatics. The program aims at redesigning instructional material developed under the Curriculum Development Cooperative to reflect the changes in health information technology and health care delivery and aligning the revised instructional material with the institutional curricular content.

All degree-seeking graduate students must take a common core of five health informatics courses. The selection of these courses is driven by current demands in research and industry. Electives of both the M.S. and PhD are approved on a case-by-case basis by academic advisors. Advisors work with students to propose electives that meet their specific professional and research needs.

A minor is also required of PhD students. The minor is intended to enrich the PhD student's breadth in academic study and is administered outside the department. The PhD minor consists of 12–15 credit hours of courses that are chosen by the external minor department. The areas chosen by PhD students reflect this philosophy of breadth; recent minor declarations have included Computer Science, Statistics, Library-Information Science, Bioinformatics, Bioengineering, and Dentistry. Customized minors that further increase breadth are also feasible with consultation with the advisors.

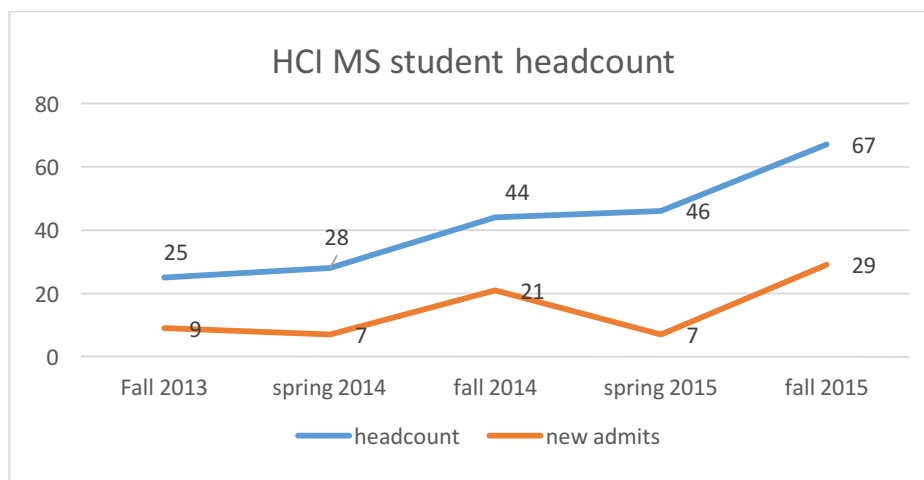
Purposes, Reputation, and Aspirations of the Human-Computer Interaction Graduate Program

1. Reputation

- a. *Estimate of the program's national ranking based upon numbers of graduates, subsequent placement of graduates, level of support, or other criteria appropriate to the discipline.* The M.S. in Human-Computer Interaction is a 36-credit-hour program that integrates interactive computing, user experience (UX), usability, interaction and interface design, and the social sciences in the research, design and development of user-centered and socially acceptable interactive technologies, applications, and information systems.

The program prepares graduates for a career in private industry or academia, or for admission to the PhD in Informatics program with a Human-Computer Interaction specialization. Upon or before graduation, HCI students have found full-time jobs and internships as user experience researchers and designers at top companies in Indiana and worldwide, including Yahoo!, Google, Pearson, Apparatus, FormStack, Salesforce, WalmartLabs, Eli Lilly and Company, Dell, Intel, Demandware, SAP and many others.

There are over 67 students currently in the program, which has picked up a very healthy growth trend of approximately 20–30 new students every year (including fall and spring admits), and with cohort of prospective students bound to grow rapidly.



Since its inception in 2003, the MS in HCI has graduated approximately 200 students, who went on to secure job positions mainly in the many industry sectors in which human-computer interaction plays an increasingly major role, in both large and medium-sized organizations. Based on 2013–2014 job placement data for the program ($n=12$), the MS in

HCI program has 100% job placement rate, with all students finding employment in their major with an average starting salary of \$86,000. Examples of job positions students have secured include user experience (UX) designer, UX researcher, front-end web developer, user interface designer, usability engineer, and search quality specialist.

The program may be completed in two years by a full-time student. Part-time study are available to domestic students. However, international students and any students funded directly by the School of Informatics and Computing (in the form of an assistantship or fellowship) must complete the program in two years.

The program aspires to be among the top ten in the nation, and among the top 5 in the Midwest, with competing MS in HCI programs in major universities, including Carnegie Mellon University, Georgia Tech, DePaul, and the University of Washington. Together with the HCI program in the part of the School on the Bloomington campus, HCI faculty and students collectively (Indianapolis and Bloomington) constitute the second largest body in the US, second only to Carnegie Mellon University's HCI Institute.

Program Processes:

1. Program Content

a. *Structure, breadth, and depth of program.*

The program content includes three specific components:

- Eight core courses that cover the foundation of human-computer interaction theory and practice, by providing students with a selected, but comprehensive preparation in (a) interaction design methods and conceptual tools to be a successful and competitive HCI practitioners (e.g., user research and user requirements, user interface and user experience modeling, analysis, design, and usability evaluation); (b) theoretical knowledge to understand, interpret, and contribute research to complex activity surrounding human-computer interaction (psychology and human factors in computing, social and collaborative computing, and ubiquitous computing).
- Two elective courses to be chosen among the department electives in Human-Centered Computing or in other schools offering courses that complement the preparation of the HCI core (e.g., visual communication or design thinking courses at the Herron School of Art and Design). A recommended elective is an industry internship for up to six credits, which most students pursue.
- Final Capstone Project or Thesis (two sequential courses) that enable students to apply in a research or professional practice setting the knowledge learned in the course towards a final HCI project (theoretical, experimental, or applied in nature) in collaboration with an external industry client, and guided by the academic supervision of an HCI faculty member.

b. *Desired learning outcomes for students.*

See Appendix A for the learning outcomes of HCI.

c. *How has the department curriculum responded to new directions in the discipline?*

The curriculum has evolved over the last decade to keep the pace with the fast-changing HCI industry and research areas, and also to meet the increasingly sophisticated needs and

expectations of the students. Specifically, key milestones that characterized the positive growth and evolution of the curriculum include the following:

- 2009–2010: Integration of the two-semester Capstone Project class in the curriculum, to obviate the need for students to find individual project or thesis advisors, an approach that was not sustainable with the program’s growth. The “final project” class was introduced to provide to students a more structured scaffolding of their final project effort, with an instructor of record for the capstone class every semester. This change led to increased student retention, higher on-time graduation rates, and more efficient workload for the research-active faculty, who could focus on mentoring PhD students.
- 2015: Thanks to the new advisory board of the department, industry partners were systematically included to serve as “clients” for student capstone projects. Each capstone team is matched, based on preference and skillset, to an industry client to orient the application of the learned HCI skills towards a real-world problem space and project.
- 2008–present: The program increasingly added online sections to its in-class courses. Currently 80% of the in-class sections are also offered online to increase flexibility in matching the student scheduling needs and commitments.
- 2003–present: The content of the courses has been refreshed and updated every year thanks to the inclusion in the faculty body of seasoned user experience (UX) professionals from local industry, who serve as adjunct faculty for key courses in the program. This offers students an industry perspective into the discipline and helps make graduates job-ready.
- Since 2008, internships were explicitly included in the curriculum and recommended to the students in search of electives.

d. *Curricular philosophy*

The basic principle behind the core is rooted in the fundamental definition of the field of human-computer interaction as indicated in the ACM HCI Curriculum: “Human-computer interaction is a discipline concerned with the design, evaluation, and implementation of interactive computing systems for human use and with the study of major phenomena surrounding them.”

The program strives to offer a comprehensive yet deep preparation that touches the fundamental methodological and theoretical areas of the field, with an emphasis on the professional knowledge needed to succeed in industry and selected research and application areas connected to the strengths of the research faculty.

Purposes, Reputation, and Aspirations of the Library and Information Science Graduate Program

1. Reputation

- a. *Estimate of the program’s national ranking based upon numbers of graduates, subsequent placement of graduates, level of support, or other criteria appropriate to the discipline.*

Currently, most ranking information compiled on a national basis combines the IUPUI LIS program with the IU Bloomington Information and Library Science Department, because we are at present jointly accredited.

There are two well-known measures of reputation and ranking: *U.S. News and World Report*, Graduate Programs, and W.H. Walters and E.I. Wilder's *Disciplinary, National and Departmental Contributions to the Literature of Library and Information Science*, 2007–2012, *Journal of the Association for Information Science and Technology*, 2015.

The *U.S. News and World Report* study is based on a reputational survey of the 43 US-based ALA-accredited programs. This includes Indiana University, Bloomington, and IUPUI as one entity listed as "IU Bloomington." One of the areas it cites, School Library Media, ranking 13th nationally, is only offered at IUPUI, and IUPUI faculty have been leaders in this area (e.g., Danny Callison, former Executive Associate Dean, and Annette Lamb, current senior lecturer). IU-Bloomington is ranked 8th overall.

When IUPUI is separately considered, the plan is to be in the top 20 initially and in the top 10 eventually. The top 10 are all large programs, and all except Simmons College, are doctoral-level programs.

The *Journal of the Association for Information Science and Technology* is very recent and is the only known study to distinguish IUPUI and IU-Bloomington. Based on 8,500 articles published in 31 core journals, IUB ranked 1st among 60 LIS programs in the United States and Canada, and IUPUI ranked 18th. Out of all sources (e.g., library departments, departments of other disciplines), IUPUI ranked 39.

IUPUI is probably in the 25th to 50th percentile (smallest to largest) in numbers of graduates among ALA programs.

Program Processes:

1. Program Content

a. *Distinctive characteristics.*

Compared with other accredited MLS programs the program's distinctive characteristics are strong offerings and student interest in children, youth, and school media; public library curriculum and research; civic engagement; a growing focus on digital archives; and online delivery with in-state tuition rates for all students. It is unusual for a non-doctoral program to have the quantity and quality of publications and presentations represented by Drs. Applegate, Copeland, and Lamb. That is, the student body is characteristic of a teaching-oriented university, but the faculty are more characteristic of a research-oriented university.

b. *Structure, breadth, and depth of program.*

The curriculum is concerned with recordable information and knowledge, and the services and technologies to facilitate their management and use. The curriculum of LIS encompasses information and knowledge creation, communication, identification, selection, acquisition, organization and description, storage and retrieval, preservation, analysis, interpretation, evaluation, synthesis, dissemination, and management. The LIS master's provides a balanced generalist degree in Library and Information Science, addressing the core competencies of professional librarians (<http://www.ala.org/educationcareers/careers/corecomp>) and American Library Association Committee on Accreditation standards:

“*Library and information studies* [is] concerned with recordable information and knowledge and the services and technologies to facilitate their management and use” (Standards for the Accreditation of Master’s Programs in Library and Information Studies). The MLS is an entry degree for a professional librarian, universally required for professionals in academic libraries and essential for leadership in public libraries. The MLS provides valuable information and management skills for people who advance information connections in a variety of organizations, whether public, private, or nonprofit.

There is a three-credit undergraduate prerequisite to ensure all students have the required background in information technology theory and technique. This course can be waived by examination. The 36-credit program consists of 15 credits of core courses and 21 electives. The core courses cover user services, collections management, information organization, research, and management. Specializations offer tailored programs of study for children and youth services, public libraries and adult services, academic librarianship, technical services, school media, and technology management.

c. *Interdisciplinary program offerings.*

There is a dual degree program with Law (JD/MLS) and with the Department of History (MA/MLS: Public History).

Currently, MLS students can take up to six credits from other graduate programs in the School. Except for the *Consumer Health Informatics* course, this does not often occur, because most MLS courses are online. Students in other graduate programs may also take MLS courses, although visa limitations prevent international students from taking more than one online course per semester.

Two new initiatives of the School are interdisciplinary. The School has begun a Master’s of Science in Informatics with a 15-credit core of Informatics and a 15-credit specialization. There is a *Knowledge and Information Management* specialization that prepares graduates to work as knowledge managers in corporate and other settings.

SoIC, the School of Liberal Arts, and Herron School of Art and Design are collaborating on a digital humanities initiative, beginning at the undergraduate level. The LIS program has designed six undergraduate courses to serve this major, beginning with offerings in the summer and fall of 2016. The courses are LIS S222 Social Science Information, LIS S223 Genealogy and Local History Resources, LIS S281 Introduction to Archives, LIS S303 Information Organization, LIS S321 Humanities Information, and LIS S352 Digital Libraries.

d. *Desired learning outcomes for students.*

Please see Appendix A for learning outcomes.

e. *How has the department curriculum responded to new directions in the discipline?*

During 2013–2015, five new courses were developed (*Public Library Services, Grant Writing, Marketing, Scholarly Communication, Project*) and offered. Six undergraduate courses have been approved but not yet offered.

The core requirements of the degree correspond to the perennial areas of concern. During 2013–2015, faculty made changes to course titles and descriptions to remove obsolete specifics and to indicate a broader basis for the content.

<i>Old</i>	<i>New</i>
Reference	Information Services
Collection Development	Acquisition and Management of Knowledge and Information
Evaluation of Library Sources	Evaluation of Information Sources
Perspectives on Librarianship	Perspectives on the Information Professions
Information Inquiry for School Teachers	Information Instruction
Technical Services	Advanced Resource Management

Cataloging was dropped as a requirement and replaced with *Organization and Representation of Knowledge and Information*.

- f. *What is the philosophy that has driven the establishment of the core, elective, and minor (i.e., minors offered for students in other departments) curricula.*

The philosophy of the program is “shepherding into the future.” The constant is the flow of recordable knowledge between and among people and the infrastructure and services that enable this change constantly. The program strives to meet the needs of today while opening students’ eyes and minds to the evolving variety of ways in which their skills will apply and will grow throughout their professional careers. Faculty maintain a connection with where they are now—their enthusiasm, their service orientation, their passions—for example, for helping youth—and point them towards the leadership positions they will occupy in the future.

Purposes, Reputation, and Aspirations of the Media Arts and Science Graduate Program:

1. Reputation

- a. *Estimate of the program’s national ranking based upon numbers of graduates, subsequent placement of graduates, level of support, or other criteria appropriate to the discipline.*

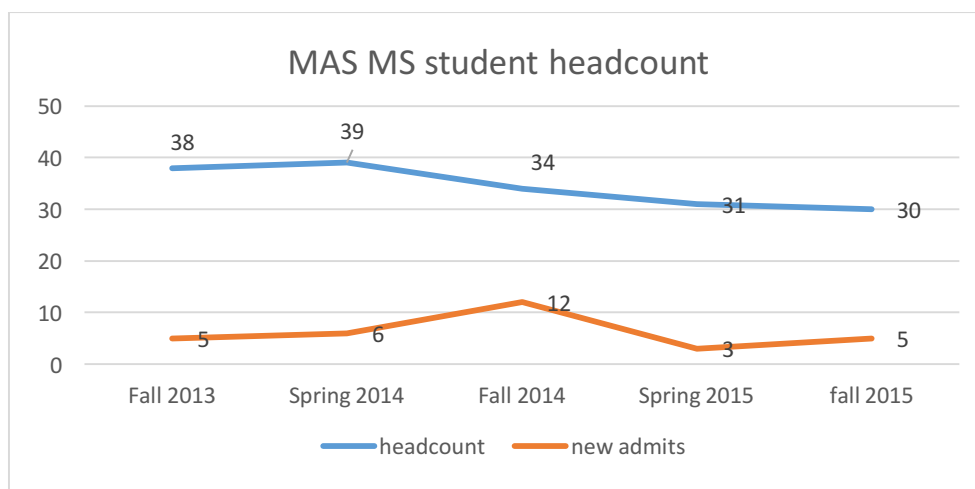
The Media Arts and Science MS degree was established in 2002 in the IU School of Informatics and Computing. This MS is a professional program and one of the first in the nation focusing on digital media application design and production with a balance between conceptual foundations in digital design and in-demand media production skills.

The program, in existence for 13 years in the IU School of Informatics and Computing, targets students with an interest in the research and design of digital media and digital storytelling experiences for a variety of organizational and industry settings. Students in the program are interested in pursuing in-depth knowledge and skills for developing digital media projects in a holistic manner. Historically, students have come from diverse areas, such as healthcare, art, education, journalism, telecommunications, communication studies, the social sciences, design, history, information and library science, computer science, philanthropy, education, and so on.

Based on Dr. Edgar Huang’s 2009 study *Teaching Button-Pushing versus Teaching Thinking: The State of New Media Education in US Universities*, there were 170 similar programs in the US. Examples of similar programs include Media Informatics housed

under the College of Informatics, Northern Kentucky University. Its founding dean, Dr. Douglas Perry, who used to work at IUPUI, took the IUPUI School of Informatics and Computing model there in 2006; the Media Arts and Science program at the MIT Media Lab; and the MS in Digital Media at Georgia Tech.

What follows shows a snapshot of the number of students currently in the program and the ones admitted in recent semesters. The goal of the program as it evolves (see next sections) is to have approximately 30 students admitted every fall.



One of the innovative aspects of the program is to enable students to engage in creative design and development and research that promote the academic discipline. This program enables students to integrate studies in media history, theory, research, design, development, evaluation, and assessment practices in production work in audio, digital media, film, games, simulations, and video, so they can advance in almost any area of this wide-ranging field. Media Arts and Science graduates use their degree to enhance their current careers or build new ones in a broad spectrum of fields.

Flexibility and interdisciplinary study is a key to the success of this program. Students work closely with an advisor to identify their interests and select courses that fit their goals. Classes are held during the day and evening to accommodate the schedules of working professionals.

Over the last decade, the MAS MS program has graduated 224 students, who went on to work in important positions in the digital media industry. Students with an MS degree work in the Hollywood movie industry, healthcare systems, news agencies, design agencies, digital media companies, digital media production companies, and higher education. One of the aspirations of the program is to leverage the interest of the students and the strengths of the program to educate more students on how to exploit the media design and development opportunities increasingly available in Indiana.

Program Processes:

1. Program Content
 - a. *Distinctive characteristics.*

The program accommodates working professionals by offering many evening courses and an increasing number of online courses, along with a flexible timetable for degree completion for part-time student. Full-time students can complete the program in two years by following a structured semester-by-semester plan of study (e.g., <http://soic.iupui.edu/files/mas-ms-fall-2015.pdf>).

b. *Structure, breadth, and depth of program.*

The current structure of the program offers an essential core of four courses centered on introduction to media production, foundations of multimedia technology, interaction design, and industry trends in innovative media and communication. Students can then choose four elective courses to expand their knowledge in specific MAS areas, including

- MAS Internship (N505)
- User Experience Design
- Game Design and Development
- 3D Graphics and Animation
- Web Design and Development
- Digital Media and Healthcare
- Audio and Video Production
- Media and Technology Entrepreneurship
- Engagement in faculty research projects: Independent Study

Students then complete a 6 credit, two-semester capstone project in a selected area of focus under the direct supervision of a faculty member. Students present their final project at the Capstone night at the end of the semester together with all graduating students in the department.

c. *Desired learning outcomes for students.*

See Appendix A for Media Arts and Science learning outcomes.

d. *How has the department curriculum responded to new directions in the discipline?*

By acknowledging the fast pace of change of the media arts and science field, the program curriculum is currently undergoing a substantial redesign to meet the changing needs of the industry and the growing opportunities of the profession. This redesign, developed in consultation with the Department Advisory Board and the program faculty, has led to the integration of new areas of study that will make the program even more competitive and attractive for students. Under this new vision, students will gain a broad understanding of the range of current and emerging digital media ecosystems and will be guided to develop individualized specializations in domains that include

- Gamification and media design strategies for health and well-being
- Social media and communications strategies for customer engagement
- Advanced applications of media design, including 3D printing.

In these domains, students will also develop specific technical competence in a variety of digital media emphases that are the traditional focus of the program, including audio and video production, web and mobile design and development, game design and

development, and 3D graphics and animation. The new curriculum, outlined below, will come into effect in fall 2016.

There is already evidence of this new direction of the program, including examples of innovative student experiences with faculty in pursuing highly interdisciplinary and community-engaged projects, such as

- Students and faculty applying Media Arts and Science production methods to innovate the way prosthetic cosmetics are designed and produced owing to advances in 3D digital modeling and 3D printing technology (collaboration with the School of Dentistry).
- Community-engaged projects where faculty and students apply media arts and science skills to develop interactive applications to (a) augment the ability of the Latino community in Indiana to access critical information and resources about legal fraud (in collaboration with the Legal Informatics faculty); (b) enhance the visitor's experience through new interactive "apps" associated with nationally renowned exhibits in collaboration with the Indianapolis Museum of Art.

e. *Curricular philosophy*

The principles that have inspired the development of the new curriculum are based on the increasing convergence of traditional digital media production, interaction design, customer engagement, and novel forms of digital fabrications. Based on this principle, the proposed enhanced curriculum combines theory and practice of research-based design and the production of omnichannel digital media. With the guidance of faculty, supplemented by interactions with working professionals and domain experts, students will develop cutting-edge industry knowledge and in-demand skills in SoIC's state-of-the-art technology labs. The new proposed core and electives include several new courses and a re-focusing of existing courses.

Core (18 cr.)

- NEWM N500 Principles of Multimedia Technology
- NEWM N512 Trends in Media, Informatics, and Communications
- INFO H541 Interaction Design Practice
- *Domain Depth Selectives (choose two):*
- N507 Digital Media for Healthcare
- N534 Serious Games and Simulations
- N549 3D Prototyping and Articulation
- *NEW* N585 Architecting Digital Media Ecosystems: Strategy and Design
- *NEW* INFO H599 Advanced Topics in HCC – section: Expert Feedback Studio on Novel Media Applications (with city entrepreneurs)

Recommended electives (6 cr.)

- N501 Foundations of Digital Production
- NEWM N505 Internship in Media Arts and Technology
- *NEW* NEWM 548 3D Printing for Applications in Medicine (pre-req.: N549, proposed)
- *NEW* INFO H559 Media and Technology Entrepreneurship
- *All graduate sections in media production areas (Video, Audio, Gaming, 3D*

Graphics & Animation, Web Design and Development)

- NEWM N553 Independent Study
- *NEW* N585 Architecting Digital Media Ecosystems: Production and Analytics

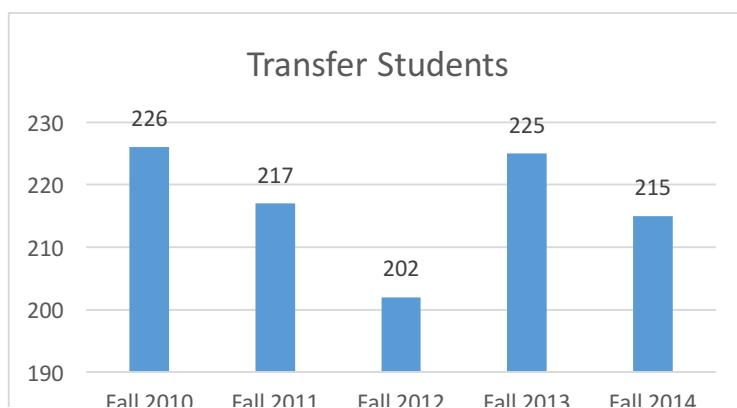
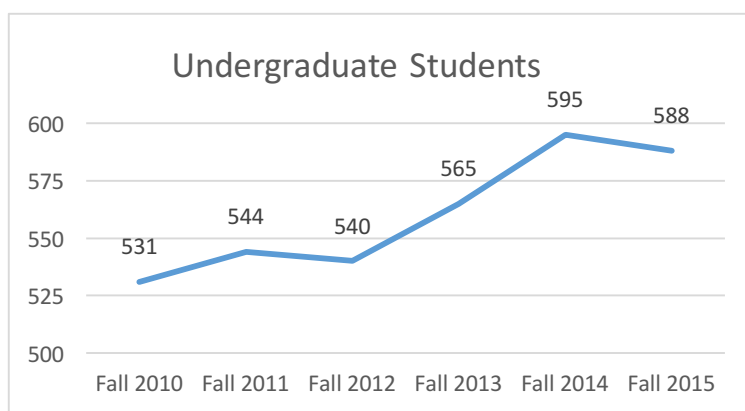
Final Project or Thesis (6 cr.)

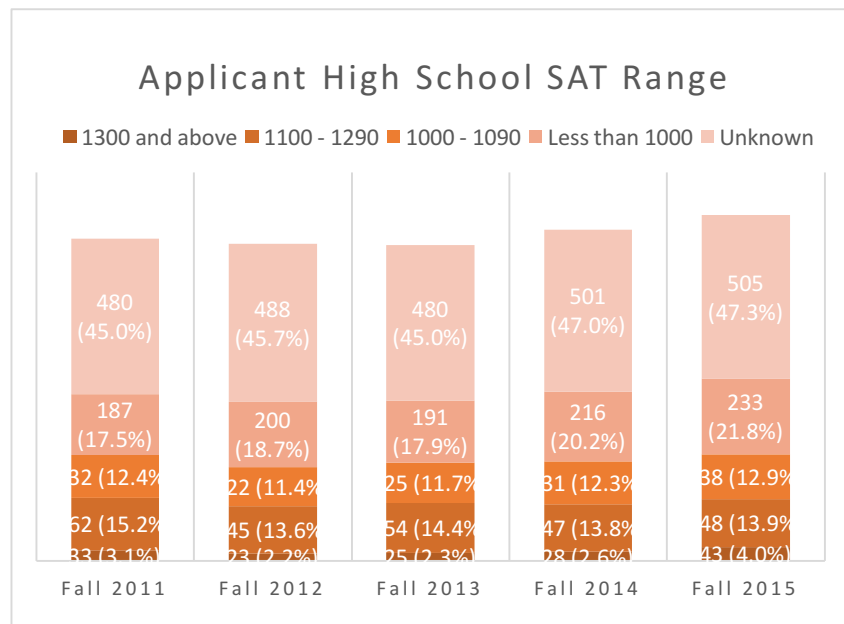
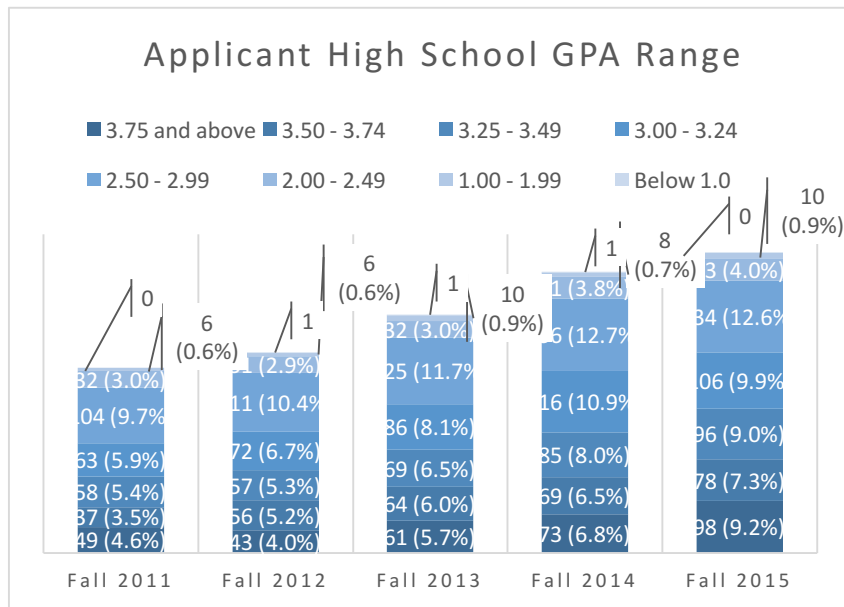
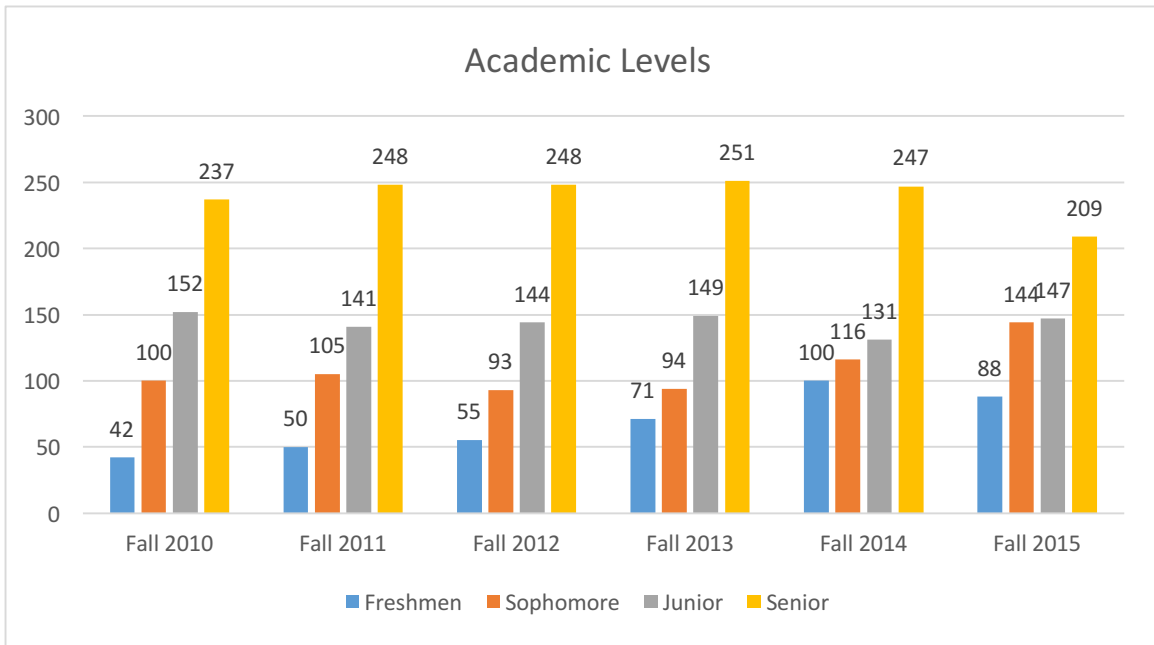
- NEWM N506 Media Arts Project or Thesis (1-3 cr. variable credits, also over 3-4 semesters)

To reach a broad student audience, a wide-ranging marketing campaign is ongoing to connect the new MAS program to students looking for a graduate degree in digital media. The campaign is targeting hundreds of relevant websites for strategic placement of behavioral and search-based ads and has generated over 2,000 visits to the MAS MS program page in three weeks.

Resources for Undergraduate Students:

1. Students (Data for the past 5 years, if available)
 - a. *Characteristics of students majoring in the program (number, SAT, GRE, GMAT, LSAT scores, GPA, TOEFL scores for international students and other relevant characteristics).* The data below shows the number of all undergraduate students, breakdown of students by academic levels, SAT scores and GPA ranges of Informatics applicants within the last five years.





b. *Description of recruitment practices and admissions criteria for both undergraduate and graduate students including how judgments are made.*

The undergraduate advisors are responsible for recruitment of the following students: transfer, intercampus, changes of major, non-traditional, and non-degree seeking. The school hosts many events enabling interested students to visit the School of Informatics and Computing, to meet with the advisors, and to discuss their interest in and application to IUPUI. Advisors also attend college fairs, reply to email inquiries, meet one-on-one with prospective students and visit major exploratory classes across the IUPUI campus.

For direct admissions as an undergraduate students, the School of Informatics and Computing requires a high school diploma and a 3.0 GPA or cumulative SAT score of 1000 or higher. Students who do not meet that these requirements but are accepted based on IUPUI's admissions criteria are placed into University College, pursuing a pre-Informatics degree. Once their GPA is raised above a 2.5 (before fall 2014, 2.0) with at least 12 IUPUI credit hours and a B- or higher in an identified course in the major they are pursuing, the students are then admitted to the School of Informatics and Computing.

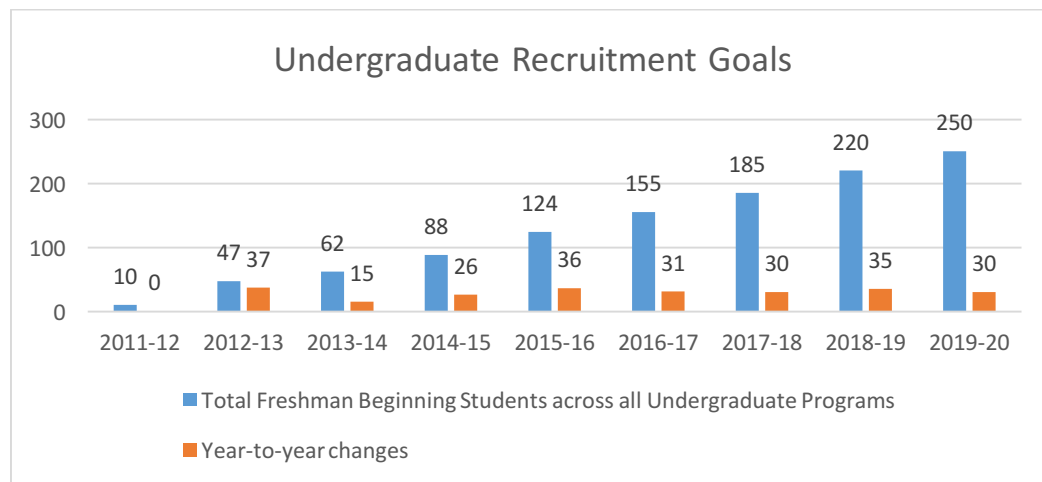
SoIC recently hired a full-time undergraduate recruiter in May of 2015 to help promote the three undergraduate programs and speak in high schools throughout Indiana. The recruiter has prioritized high school visits based on GPA, diversity, and technical classes focused in technology, art, science, and psychology. The recruiter implemented a customer relationship management (CRM) system, which currently tracks all prospective high school students through 2020. The recruitment plan includes over 100 high school visits throughout the year and recruiting efforts will go outside of Indiana by 2018.

Working closely with SoIC's communications director, the team has developed a new marketing stream and updated social media outputs with expectations to reach the high school niche, creating simple one-page flyers to place with guidance counselors, with teachers, and in classrooms. The recruiter has also developed a visually stimulating video presentation to educate students about each undergraduate program. The presentation includes actual student work, recent placement of graduates through career services, scholarship information, and admissions requirements.

One of the main goals for recruiting is to inform the community on what informatics means and the careers available in this field. The recruiter is participating in outreach events including Teachers Summit, Guidance Counselors Breakfast, META College Fair, Upward Bound Career Event, Homeschool Event, Mobile Application Competition, iDEW Project, summer workshops, and on-campus class tours and is actively promoting the research, international, service learning, and experiential learning (RISE) initiative by speaking about study abroad, service learning, and research opportunities.

The School of Informatics and Computing participates in numerous college fairs throughout Indiana by purchasing a table and bringing materials, lead cards, student projects, and promotional items, allowing the recruiter and/or advisors to speak directly with juniors and seniors and their parents or decision makers. The recruiter is also working closely with prospective students through the entire matriculation process from the time they apply to their first scheduled class. The application process has become more personalized by giving one-on-one family tours and through a first-class Jag Day

experience. Follow-up is performed after a prospective student applies with upcoming deadlines and invitations to events such as student capstone events, class observations, senior events, honors events, pre-orientation events and hands-on workshops. The recruiter then partners the students with advisors to ensure students are registered and attending orientation, Bridge, and their first week of scheduled classes.



Within the next year, the recruiter hopes to have at least 124 undergraduate admits (30% increase) with a 5% increase in both diversity and high ability students. The lists below are the number of recruiting activities done by the recruiter and applications gained since May 2015.

Recruitment Activities	#
Open Houses	2
HS Senior Events	4
Weekly Presentations	8
College Fairs	10
Family Visits	50
High Schools Visited	98
High School Classrooms Visited	196

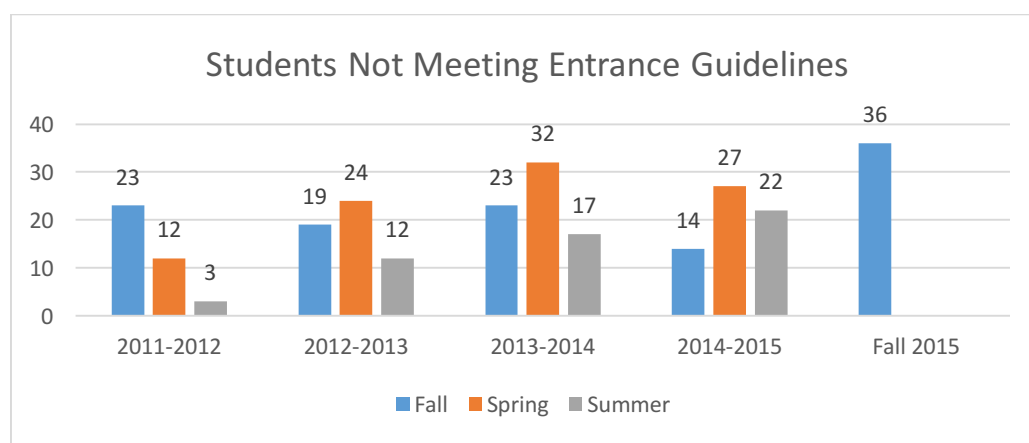
Applications Gained	#
High School Presentations	130
Other(online, IUPUI admissions)	30
College Fairs	20
Summer Workshops	10
Open Houses	10
Total Applications Gained	200

- b. *Activities and resources that serve University College students who declare a major in the department but have not yet met the department's entrance requirements.*

Advisors meet with University College students to ensure they are taking the correct courses for a smooth transition once they are directly admitted to the School of Informatics and Computing. Advisors also meet with University College advisors on a regular basis to train new advisors on SoIC majors and keep them updated on changes to the plans of study. University College students benefit from free tutoring and advisor appointments, while pursuing a pre-Informatics major in University College.

- c. *Number of students who declared a major in the department but failed to meet the department's entrance guidelines.*

Over the past five years, 264 students declared a major within SoIC but failed to meet SoIC admissions requirements. As a result, these students have been placed into University College. Once the students meet the SoIC entrance guidelines, they can declare their major within the school. In fall 2014, SoIC increased the admission requirements from a 2.0 to a 2.5 GPA, which resulted in an increase in the number of University College students. This initiative was made with the expectation that by admitting better-prepared students SoIC retention rates would increase.



d. Types and levels of financial assistance available.

See Appendix B for School of Informatics Competitive Undergraduate Scholarships and Appendix C for Admission-based Scholarships for full-time beginning freshmen for Indiana residents.

e. Numbers/percentages of women, minorities, international students in the population of majors. Description of any special programs to recruit minority students.

The School of Informatics and Computing at IUPUI is engaged in a number of programs designed to recruit women and underrepresented minorities. While the majority of recruitment takes place in high school classrooms and college fairs, or involves visits of high school students to SoIC, many of the larger initiatives to bring women and underrepresented minorities into the computing pipeline involve collaborations with units on the IUPUI campus, community and nonprofit organizations, industry, and long-term partnerships with area schools.

SoIC's largest diversity recruitment effort to date is the recently launched Informatics: Diversity-Enhanced Workforce (iDEW) project. With funding and support from over 20 community partners, the school is teaching a computer science course in Arsenal Technical, Pike, and Providence Cristo Rey high schools. Working alongside high school teachers, faculty from SoIC are delivering a project-based curriculum to help engage students who might not otherwise explore careers in computing and information technology. SoIC faculty develop and deliver curriculum to cover six semesters for freshman, sophomore, and junior classes with SoIC students assisting in the classroom. By the third year, each school will have three student cohorts in the iDEW program. Seniors in the program will hold internships, take classes on the IUPUI campus, and act as mentors

to underclassmen. The first student cohort is 64% African American, 27% Hispanic, 9% white, and 29% female. During the first two months, SoIC faculty and students have logged more than 7,500 contact hours with IDEW high school students.

A second ongoing school program is the Computer High Informatics Program for Success (CHIPS), a weekly, two-hour after-school club on Mondays for students at IPS Harshman Middle School. Three SoIC faculty members provide mentoring to the IPS students as well as to a team of six Harshman teachers being trained to lead the program next year. These six teachers meet with the three SoIC instructors an extra hour on Tuesdays for this training. Because the IPS and the IUPUI calendars are not always in synch, fall 2015 CHIPS sessions are limited to 11. However, for spring 2015, there were 15 sessions. CHIPS student attendance varies from week to week depending on their other commitments, but generally ranges from 18–22, or approximately 20 students per week. Contact hours in spring 2015 were 900, with 120 contact hours logged per week in fall 2015.

SoIC is a regional partner in the STARS Computing Corps, a student-driven community focused on growing a diverse technology workforce. STARS began with a 2005 National Science Foundation grant to broaden participation in computing and transitioned to a nonprofit in 2012. A member since 2010, 35 SoIC STARS students have served as ambassadors at more than 170 recruitment and outreach events, reaching over 13,000 individuals and logging approximately 17,000 contact hours. Over the course of the 2014–2015 academic year, STARS reached nearly 7,000 individuals. Of that number, 50% were female, 14% were African American, 5% were Hispanic/Latino, and 1% were other minority. STARS students enroll in a one-credit service-learning course.

Programs designed for female audiences (and in many cases minority audiences) include activities with partner organizations such as Girl Scouts of Central Indiana, Girls Inc. of Greater Indianapolis, FIRST LEGO League, Techpoint Foundation for Youth, Women and Hi Tech, Indianapolis Motor Speedway, Conner Prairie Pioneer Settlement, IUPUI Office for Women, and IUPUI Upward Bound. Working with these entities, the school has offered programs such as

- Girls Inc. Days at SoIC in 2013 and 2014 involving full-day programming in robotics and 3D modeling for over 100 girls per year;
- Multiple technology workshops for Girl Scout held at SoIC and the Indianapolis Motor Speedway serving over 400 girls;
- Collaboration with the Upward Bound office and the Schools of Science and Engineering and Technology at IUPUI to offer Girls in STEM, providing hands-on activities for 135 high school girls from 12 states;
- Passport to Hi Tech events at Connor Prairie Pioneer Settlement sponsored by Women in Hi Tech. SoIC offers demonstrations and hands-on experiences in virtual and augmented reality, robotics, and most recently electronics to more than 1,200 individuals;
- Annual support of the NCWIT Award for Aspirations in Computing from 2012–2015 for high school girls. SoIC promotes the program each year to high school girls, teachers, administrators, guidance counselors and community organizations serving

girls across the state of Indiana. The school awards scholarships, provides college student mentors to host tables at the annual awards dinner, and produces a promotional video for the awards each year;

- Collaboration with FIRST LEGO League, Girl Scouts of Central Indiana, and the Techpoint Foundation for Youth to encourage the formation and training of all-girls robotics teams.

Minority recruitment activities include programs created for and in collaboration with organizations such as the IUPUI Office of Diversity, Equity, and Inclusion, La Plaza, the Indiana Latino Institute, and the Indianapolis Mayor's Office. New partnerships are developing with the Center for Leadership Development and area faith-based organizations serving African American communities. Specific programs include

- Annual IndyVEX Robotics STEM Fair, providing technology demonstrations and hands-on activities to over 1,000 Indianapolis students;
- IUPUI's annual Mapping Education Toward Achievement (META) program for Hispanic/Latino high school students in Indiana. This year's event attracted to campus more than 300 students from 26 high schools to learn about educational opportunities. Informatics and Computing hosted two career sessions, serving 56 students on that day and generated a list of nearly 100 recruitment prospects;
- Summer workshop programming to Hispanic middle and high school students as part of the La Plaza summer education program;
- Annual participation of SoIC faculty in the Latino Youth Summit in collaboration with the Fairbanks School of Public Health, Herron School of Art and Design, and the School of Education;
- Tours for African-American faith-based summer programs, including the Eastern Star Church youth program with plans to expand outreach to similar organizations;
- Meetings with the Center for Leadership Development are underway to create programming to reach youth served in their programs;
- Indiana Latino Institute sponsored Latino Education Summit for high school students.

To help attract a more diverse student body, SoIC offers two important scholarships for underrepresented students, including participation in IUPUI's Diversity Scholars Research Program (DSRP) and the Aspirations in Computing program through the National Center for Women & Information Technology (NCWIT).

Up to two incoming minority freshmen who meet the DSRP standards can receive full tuition and fees through the school for up to four years. To be eligible, students must engage in research with a SoIC faculty mentor. The DSRP office provides an additional stipend to students in the program.

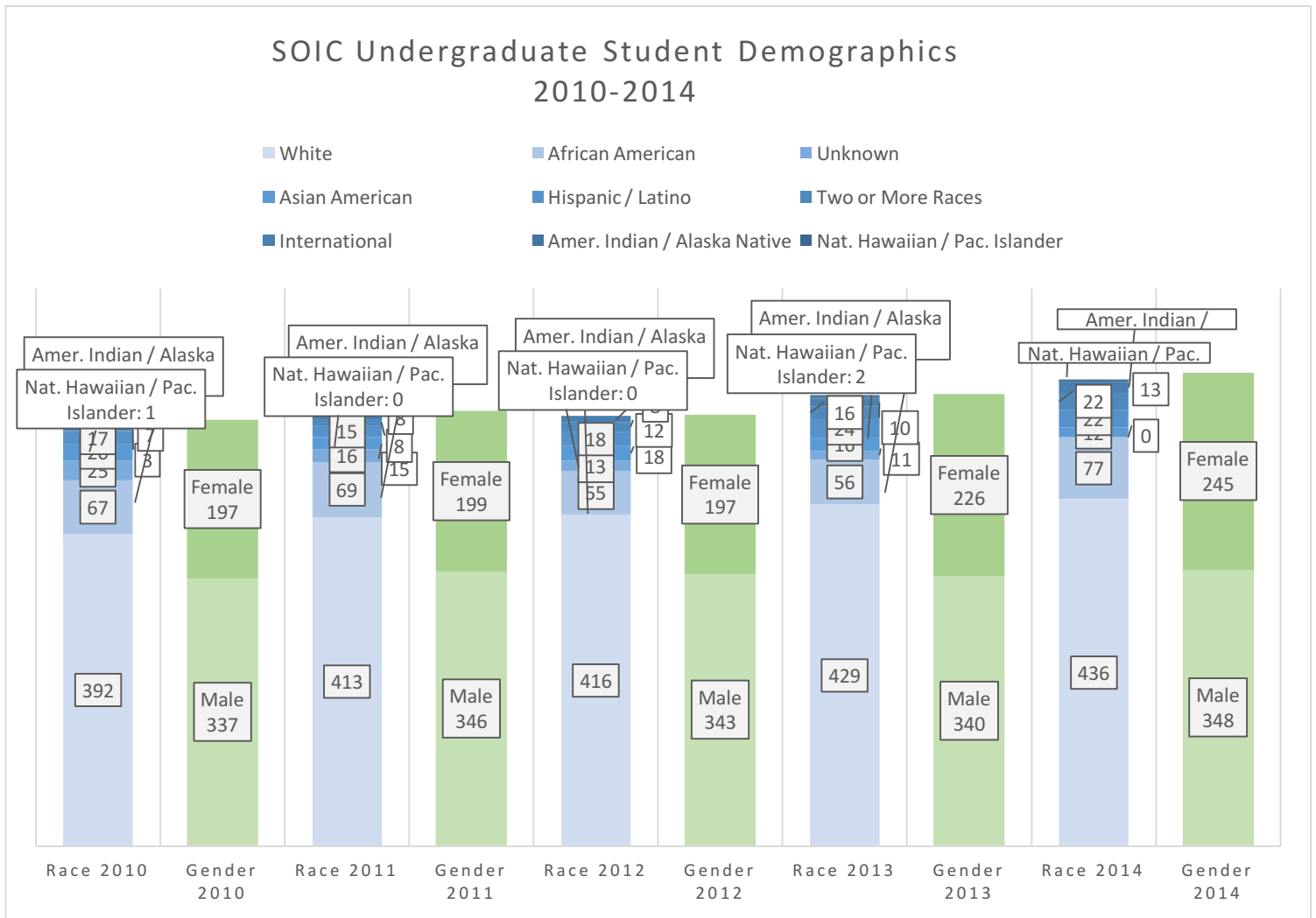
SoIC will provide a \$1,000 scholarship to incoming freshmen women who are recipients of the Aspirations in Computing Awards sponsored by NCWIT. The school's first Aspirations Award scholar graduated in May 2015 and was selected for the General Electric Information Technology Leadership Program.

For current students, SoIC promotes the Grace Hopper Celebration of Women in Computing and the ACM Richard Tapia Celebration of Diversity in Computing, encouraging students to respond to the call for participation from these conferences and offering a number of student travel stipends.

The school is also a sponsor of the IUPUI Dr. Martin Luther King, Cesar Chavez, and Harvey Milk celebration dinners.

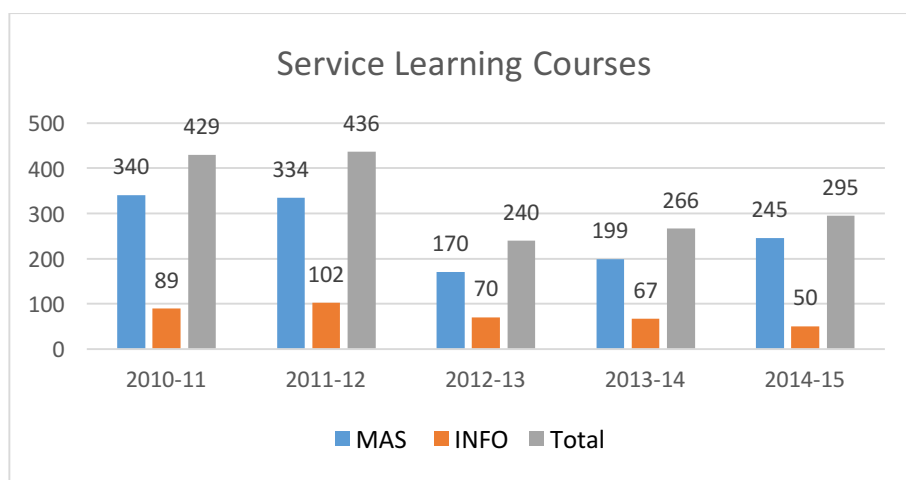
Below is a graph that gives the breakdown of demographics of SoIC's undergraduate student population since 2010.

f. Number of students in service courses.



The chart below shows how many MAS and Informatics students participate in service learning courses. The courses offered for Informatics students include *Internship in Informatics Professional Practice*, *Career Development for Informatics Majors*, *Current Topics in Informatics*, *Capstone Project Internship*, *Senior Thesis*, *Design and Development*

of an Information System, and Readings and Research in Informatics. The courses offered for MAS students include *Career Planning*, *Documenting Cultural Heritage*, *Independent Study*, *Enrichment Internship*, *Capstone Experience* and *Video for Social Change*.



2. Student Support

- a. *Description of student course placement procedures, orientation, advising, tutoring, mentoring, monitoring of progress, out-of-class contact with faculty, involvement in research and independent study, internships/field experiences, professional organizations and clubs, and other out-of-class learning opportunities.*

Undergraduate students meet with their advisors to ensure proper program progression. The school uses prerequisites to ensure that students are placed into the correct level of course. Once the foundational courses are completed, the students are able to move into the next level of courses, and this process repeats until the student completes the degree. The advisors continually work with the faculty to ensure the correct prerequisites are in place and adjustments are made as needed.

Advisors hold orientation sessions year round with the busiest time being the summer. Advisors often hold two-day group orientations for pre-Informatics and Informatics first-year students to welcome them to the program, inform them of policies and resources, and guide them in registering for courses. Most students follow the degree map related to their major and begin with foundational courses, though adjustments may be made depending on class availability, transfer credits, and AP or dual credits already earned. Advisors also hold one-day transfer orientations and meet with students individually to review transfer credits and create a plan of study for the student. In all orientation sessions, advisors are prepared to make individualized plans of study and degree maps for each student as needed.

Advising is offered for pre-Informatics and Informatics students year-round, with each advisor having approximately 350 undergraduate students. The undergraduate advisors use an online appointment scheduling system, which allows students to schedule advising appointments as convenient. For first-year and transfer students, it is mandatory that the student meets with his/her advisor at least once each semester during the first year. An advising hold is placed on the student account to ensure the student cannot register for

classes without attending the appointment. Advising is also mandated for probationary students and the same hold process is followed. Advisors also hold weekly advising hours at the Health and Life Sciences Advising Center for University College students who are interested in changing their major to Health Information Management. They also offer email and phone advising for distance learners, hold late night registration events to accommodate students' schedules, and conduct group registration in freshmen seminar classes.

Free tutoring is available for certain undergraduate SoIC courses and begins the second week of school. Courses are placed on the tutoring list based on DFW rates or by faculty request; historically, eight to ten courses have benefited from tutoring services. The school employs higher-level students, who have been identified by faculty as exceptional, to tutor peers who are struggling in certain courses.

In the first month of the semester, instructors begin using the FLAGS system, which notifies advisors of at-risk students for each course. The flag input by the faculty alerts the advisors that a student is not attending class, not turning in assignments, or performing poorly. Once the information is received, the advisor will reach out to all flagged students about the course, as well as urge the student to use the available resources offered to them (i.e., meeting with the advisor or faculty, using a tutor, attending the MAC or Writing Center). Advisors and faculty also discuss concerns about students informally when an issue or concern arises.

Currently, there are 14 active student groups within the School meant for both undergraduate and graduate students and available to students in any major. These student groups include ACM Siggraph IUPUI Student Chapter, Anime Club, Association of Library and Information Science Students, Cosplay Club, E-Sports, Game Developers' Group at IUPUI, Gamers' Guild of IUPUI, Health Information Administration Connection, Informatics and Computing Student Council, Mobile App Developers at IUPUI, Ohmniscient Audio Collective, SoIC Service Group, Students and Technology in Academia, Research, and Services (STARS), and Women in Technology. See Appendix D for the full list and descriptions of student groups.

b. Opportunities for student involvement in program planning and evaluation.

At the end of each semester, students anonymously fill out course evaluations giving feedback on their experiences in their courses. These course evaluations are reviewed for the school by the Associate Dean of Academic Affairs and for each department by the department chair. The chair addresses issues with individual faculty, the relevant Program Director, and/or advisors, as appropriate. The Associate Dean addresses broader issues, such as those involving academic policy, through the Academic Affairs Committee and Faculty Council. Students also have the opportunity to provide feedback on an annual student satisfaction survey on their overall experience in the program. The advisors read these responses and make changes as appropriate. Advisors also reach out to all students who earned a D, F, or W at the end of each semester, asking why. All of the responses gathered are closely reviewed and changes are made when appropriate.

c. *Description of efforts made to place graduates.*

Graduates during their academic career are provided many opportunities to view and apply for full-time positions. The school maintains an online recruiting system, SoIC Careers, where students view and apply for positions specifically related to their majors. During the 2014–2015 academic year, 3798 unique full-time positions were posted to SoIC Careers, including local, national, and international jobs. Positions at high profile organizations are also emailed directly to students to ensure they are aware of them and have the opportunity to apply.

The school also maintains a section of the school website to provide career-related resources, including listings of additional online job search resources and articles focused on successful job search methods at www.soic.iupui.edu/careers. Additionally, LinkedIn and Facebook are employed to connect students with alumni and employers for networking and sharing of opportunities and events.

The Career Services Office brings organizations to the campus and directly to the school for career fairs and information/recruiting sessions. Annually in the fall, SoIC is a partner in the annual Career Connection STEM Career Fair. This event brings 85 companies that are focused towards IT, engineering, and life science careers to the campus for students to meet and apply in-person for positions. Partnering with other schools on campus, SoIC participates in the staging of other career fairs, including the annual IUPUI Spring Career Fair, that are open to SoIC majors. SOIC majors are welcomed to attend the career fairs of all other schools on campus.

Throughout the fall and spring semesters, companies visit the school both in-person and virtually to explain their organization and present employment opportunities to students. In 2014–2015, companies visiting the school included Access Sciences, Ernst & Young, Salesforce, Rolls-Royce, First Data Bank, Appirio, Yahoo, Kronos, Policystat, MediaFuel, Stringcan, and Extension Healthcare.

d. *Description of efforts to support entering students, including first-year seminars and learning communities.*

When first-year students attend orientation, they sign up for either Summer Bridge or a First Year Experience course. Summer Bridge starts two weeks before the fall semester and is taught by faculty and advisors, while the First Year Experience takes place once a week in the fall semester and is taught by advisors. Both courses educate the students about college resources and other opportunities, and cover areas such as study abroad, the IUPUI Top 100 program, time management, stress management, and how different personalities have different learning styles. The Summer Bridge is especially beneficial to the school's retention rates because students are already part of a community by the time the fall semester begins. During the semesters, advisors visit classrooms and hold various events for all SoIC students.

e. *When do international students take additional English courses recommended following the EAP test?*

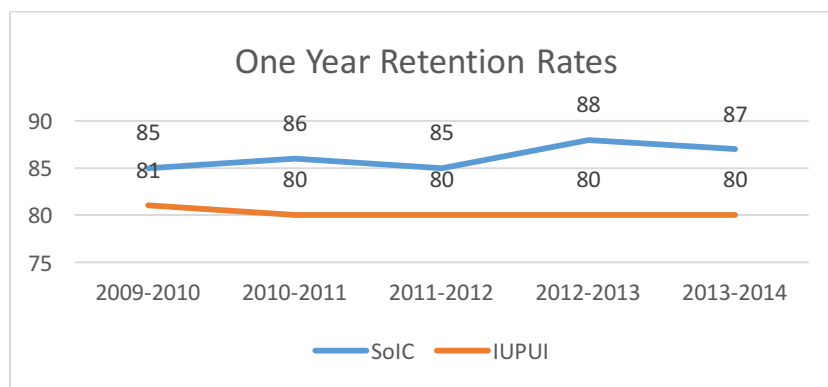
During orientation, undergraduate international students are advised to take the required level of English during their first semester. They continue to work through the English course progression as needed, until the required level of English has been completed.

Outcomes of Undergraduate Students:

1. Indicators of Program Quality

- a. *Evidence of student retention in the program.* As shown below, for the past five years, SoIC retention rates are consistently above the IUPUI campus wide retention rates.

(<http://reports.iupui.edu/render.aspx/PERSISTENCE%20RATES/ONEYRRETN/BUS>)



- b. *Number of graduates.* Graduates in the undergraduate degrees, minors and certificates over the past five years are as follows:

Graduates	2010-11	2011-12	2012-13	2013-14	2014-15
HIM	29	22	30	16	29
Informatics	20	22	19	28	30
HCI Certificate	0	0	4	4	9
Informatics Minor	1	0	1	0	0
Legal Informatics Certificate	0	4	2	2	2
MAS	67	77	63	72	62
Medical Coding	4	1	6	2	4
Studio Art Tech Minor	0	0	0	0	1

- c. *Evidence of student mastery of transferable skills (Principles of Undergraduate Learning and the Principles of Graduate & Professional Learning).*

All undergraduate courses were assessed at least twice during the review period using the IUPUI Principles of Undergraduate Learning (PULs). These PULs have been the foundation for IUPUI's most recent accreditation processes. For each course, faculty members designate the PUL of Major Emphasis, the PUL of Moderate Emphasis, and the PUL of Some Emphasis. Courses must include assignments that allow students to

demonstrate some level of mastery for the PULs that have been designated for that course. Informatics also adopted a number of competencies, which encompass general and specific learning outcomes for the degree that cover technical knowledge, the social dynamics of Informatics and information technology, domain-specific critical-thinking and problem-solving skills, collaborative teamwork, and professional ethics and development. In 2014–2015, faculty began the process of revising these competencies to be more specific to Informatics. Each course then includes its own student learning outcomes, with these learning outcomes mapped to the PULs, as well as specific assignments in the course. As part of the annual Program Review and Assessment Report (PRAC), faculty provide data to show the extent to which courses have demonstrated the stated learning outcomes as well as the PULs designated for the course. Students taking Undergraduate Informatics courses are strongly encouraged to complete the student evaluation survey at the end of the semester.

In addition to PULs, Health Information students demonstrate mastery of transferable skills by showing their experience from the Practicum courses. The students are required to present their experience to instructors, peers, and the Program Director.

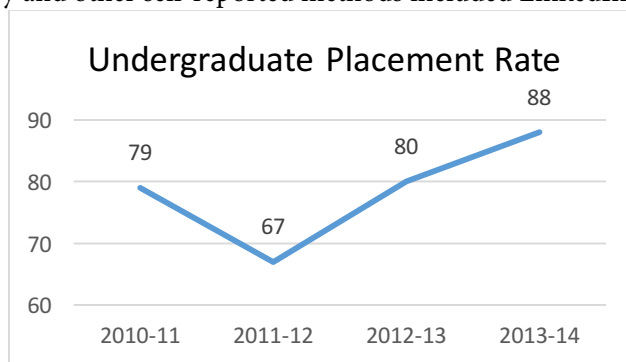
g. *Evidence of student learning in service courses offered by the department.*

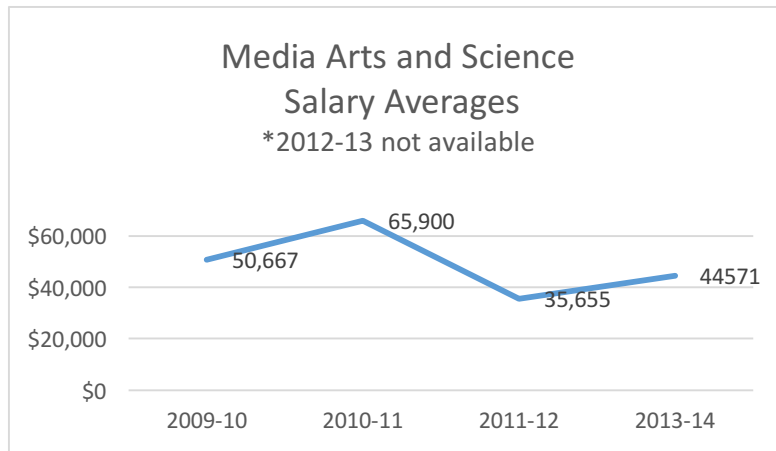
In a popular MAS service learning course, *Video for Social Change*, students explore theories of documentary filmmaking by screening and writing analyses of seminal documentaries. They also create a documentary about a cause or controversy, or work with a nonprofit client to develop material and produce a finished video. Some examples of student learning can be found in work done by two students for the IU Student Outreach Clinic. The first link was done by David Nathan Adams and was featured on IUPUI's School of Medicine website and the second was done by Zach Brown (note the three podcasts at the bottom of the page):

<https://www.youtube.com/watch?v=iX-xL688TB4>https://comet.soic.iupui.edu/index.php?seq=001_004_001&article=4

Please see Appendix H to view a reflection paper completed by a student in the same course that describes the impact the course made on him.

h. *Evidence of placement of graduate in employment in the field or in further education.* The graph below provides historical placement data of undergraduate placement rate in full-time, graduate school, or internship positions in-major within six months post-graduation from the 2010-11 through 2013-14 (most current data). The data is collected via paper and electronic survey and other self-reported methods included LinkedIn and telephone calls.



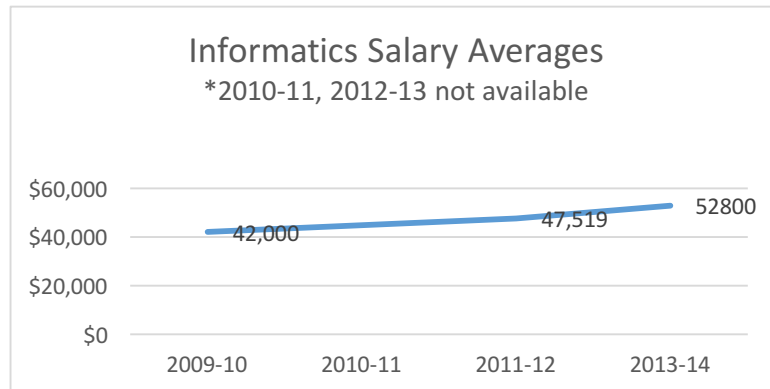


The graphs below show salary averages from the past five years from each undergraduate program:



- i. Evidence of program quality derived from surveys/interviews of current students, graduates, employers, community members or agencies.

In 2014, the School of Informatics and Computing began implementing an annual Student Satisfaction Survey, asking students to rank a variety of areas, ranging from advising to faculty concern for student success, on both importance and satisfaction. The results allow us to see the top areas that are most important to students and evaluate the students' level



of satisfaction in each of those areas. In 2014, the overall level of satisfaction with SoIC was 4.16 on a scale of 1 (lowest) to 5 (highest). In 2015, the overall level of satisfaction increased

to 4.33. This shows that the students' level of satisfaction with the program is increasing. Results from the survey can be found in Appendix E.

Prior to January 2014, the Indianapolis campus of the school had been receiving development staff support from the school's Bloomington advancement staff and had no external boards of its own and had raised only \$58,345 in fiscal year ending 2013. During the first full year of having its own development director, the school secured \$478,103 in gifts and pledges (FY 2014–2015), resulting from a total of 336 recorded contacts—95 of which were personal visits to potential funders and 14 of which were major gift proposals.

Additionally, the school created two advisory boards and an advisory council. The Department of Human-Centered Computing Advisory Board added 11 external volunteers while the Department of Library and Information Science welcomed 14 industry leaders to serve on its board. Also, the school's key civic engagement program, *Informatics: Diversity-Enhanced Workforce* (iDEW) established an advisory council of eight. The program forged many key community partnerships such as Pike, Providence Cristo Rey, and Arsenal Tech High Schools, Girls, Inc., EmployIndy, Techpoint Foundation for Youth, and Shepherd Community Center. This program has also attracted support from global companies such as JPMorgan Chase & Co. and Cummins Inc. as well as several local foundations. This program has also been selected multiple times by Indiana University to represent its limited submission process for competitive proposals. Nearly all of this growth in gift and grant revenue and the addition of many volunteers are from organizations and individuals who had never before had a connection to the school. This clearly indicates an enhanced school reputation and increased external visibility.

j. External recognition of students, faculty, or graduates including awards or honors and research awards.

Among the recent honors for students in the Informatics program are Sam Vance being named a prestigious Orr Fellow. Matt Misner was involved with the Informatics Student Government (ISG) and the STARS program. He also was able to secure an internship at a local tech company, Apparatus, as a technology analyst and is now employed by Amazon in Seattle. In the summer of 2012, Ariana Casale traveled to Paros, Greece as part of virtual digitizing class. She has served as vice president of Women in Technology (WiT), an organization that encourages women from all educational disciplines and majors to employ technology as a means to make a difference on campus and in the community, and has been involved in STARS and the Japanese Culture Club. At this year's STARS Celebration, held over the summer in Atlanta, GA, Ariana presented the poster *Struggles and Recommended Solutions for Hearing-Impaired Students in Computing Fields*. Ariana also attended the Grace Hopper Conference where she won the HP Scholarship to help with expenses for this event. Sarah Parker served as president of WiT, president of ISG, and Workshop Lead for STARS community outreach, which aims to increase the number of women and under-represented minorities in technology-related fields.

Sarah Zajac, a student from Media Arts and Science, was a 2015 IUPUI Top 100 recipient, and two HIM students have won Indiana Health Information Management Association

(IHIMA) undergraduate scholarships. Two students have received the IHIMA Professional Achievement award in 2015, and one student won the IHIMA Rising Star Award.

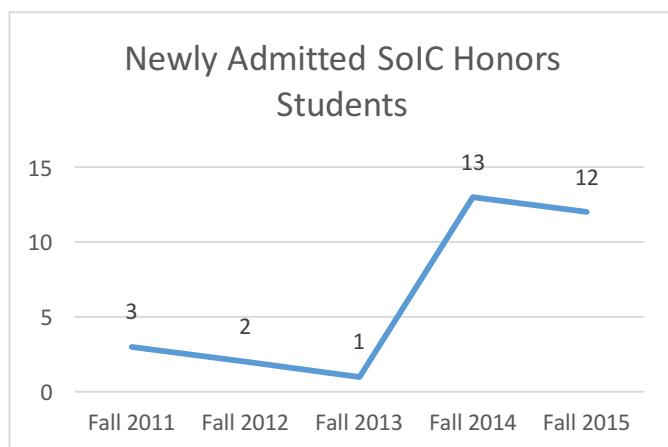
SoIC offers ten scholarships for outstanding students including specific opportunities for freshmen and transfer students. Eight SoIC scholarships were awarded in 2015 for a total of \$10,500. The full list of SoIC scholarships can be found here: <https://soic.iupui.edu/undergraduate/tuition-financial-aid/>.

- k. *Evidence that honors students benefit from honors initiatives sponsored by the school.* Over the last five years, SoIC has had 31 students enter the IUPUI Honors College. The Honors program provides high-achieving students with increased opportunities to interact with faculty members, develop relationships with other motivated students, and graduate with honors distinction from IUPUI. Honors students also have access to Honors College advisors and use of the Honors College facility, which includes dedicated study space, computer labs, and group work rooms. There are many requirements of the Honors students, including community service hours, completing honors courses, and maintaining a minimum cumulative GPA.

Honors students are required to volunteer at least 10 hours per academic year. The students benefit from this initiative because service and volunteering encourages the students to connect with and give back to the campus and community, while developing new skills, making a lasting impact on the community, and developing an understanding and appreciation of the issues in the community. Students can volunteer at external organizations they identify on their own, on campus, or at the monthly SoIC schoolwide service day. SoIC Honors students have spent at least 310 hours serving the community over the past five years.

Honors students are also required to complete 24 total Honors credit hours; at least 15 of these credits must be completed within SoIC. Within SoIC these credits are typically completed through the Honors Contract, which requires the faculty to add an honors component to their course syllabi by listing the additional requirements for the student taking the course for honors credit. Honors sections are sometimes available. Students benefit from this initiative because they gain a greater depth of learning in their major through additional challenges.

A third requirement of honors students is that they maintain a minimum cumulative GPA of 3.3. If a student's GPA falls below a 3.3, they are placed on Honors College probation. If their GPA remains below 3.3 for two consecutive semesters, they are removed from the Honors program. The Honors College has several scholarships available to the Honors students who started as a freshman in the Honors program; many of these scholarships



have a minimum GPA requirement above 3.3. SoIC has had five Honors students graduate in the past five years, and that number is likely to rise dramatically given the large increase in recent admits.

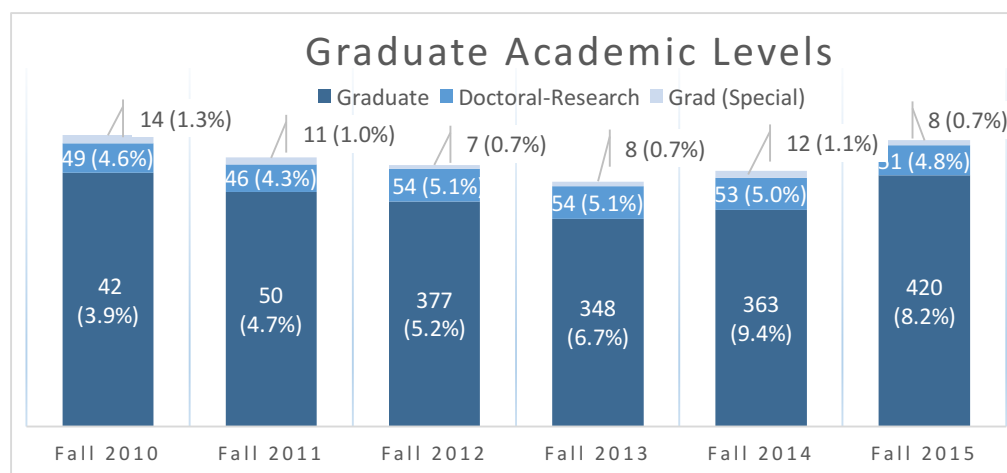
1. *Publications by students in the program.*

Please see Appendix F.

Resources for Graduate Students:

1. Students (Data for the past 5 years, if available)

- a. *Characteristics of students majoring in the program (number, SAT, GRE, GMAT, LSAT scores, GPA, TOEFL scores for international students and other relevant characteristics).* The chart below represents the number of master's and PhD students by level for the past five years.



- b. *Description of recruitment practices and admissions criteria for both undergraduate and graduate students including how judgments are made.*

Admission criteria for all graduate programs include a minimum of a bachelor's degree (with demonstrated technical skills depending on the program) and a minimum overall GPA of 3.0 on a 4.0 scale. The Office of International Affairs evaluates all international transcripts through a Foreign Credential Analysis to determine the equivalent US GPA. Students whose native language is not English are also required to submit proof of English proficiency with a minimum score of 79 for TOEFL or 6.5 IELTS. Applications are evaluated considering GPA, letters of reference, statement of purpose, GRE scores (if submitted), portfolio (if required), and CV or resume. Admissions committees comprised of graduate faculty members from the respective program review applications and decide on admissions.

Recruitment for graduate students is a collaboration of departmental faculty and the Graduate Program Coordinator. The school participates in a variety of statewide graduate school fairs including the Big Ten STEM Graduate Expo at Purdue University and the IUPUI Graduate Expo. The school participates by having a booth at statewide and national organization conferences such as IHIMA, AHIMA, Grace Hopper Celebration of Women,

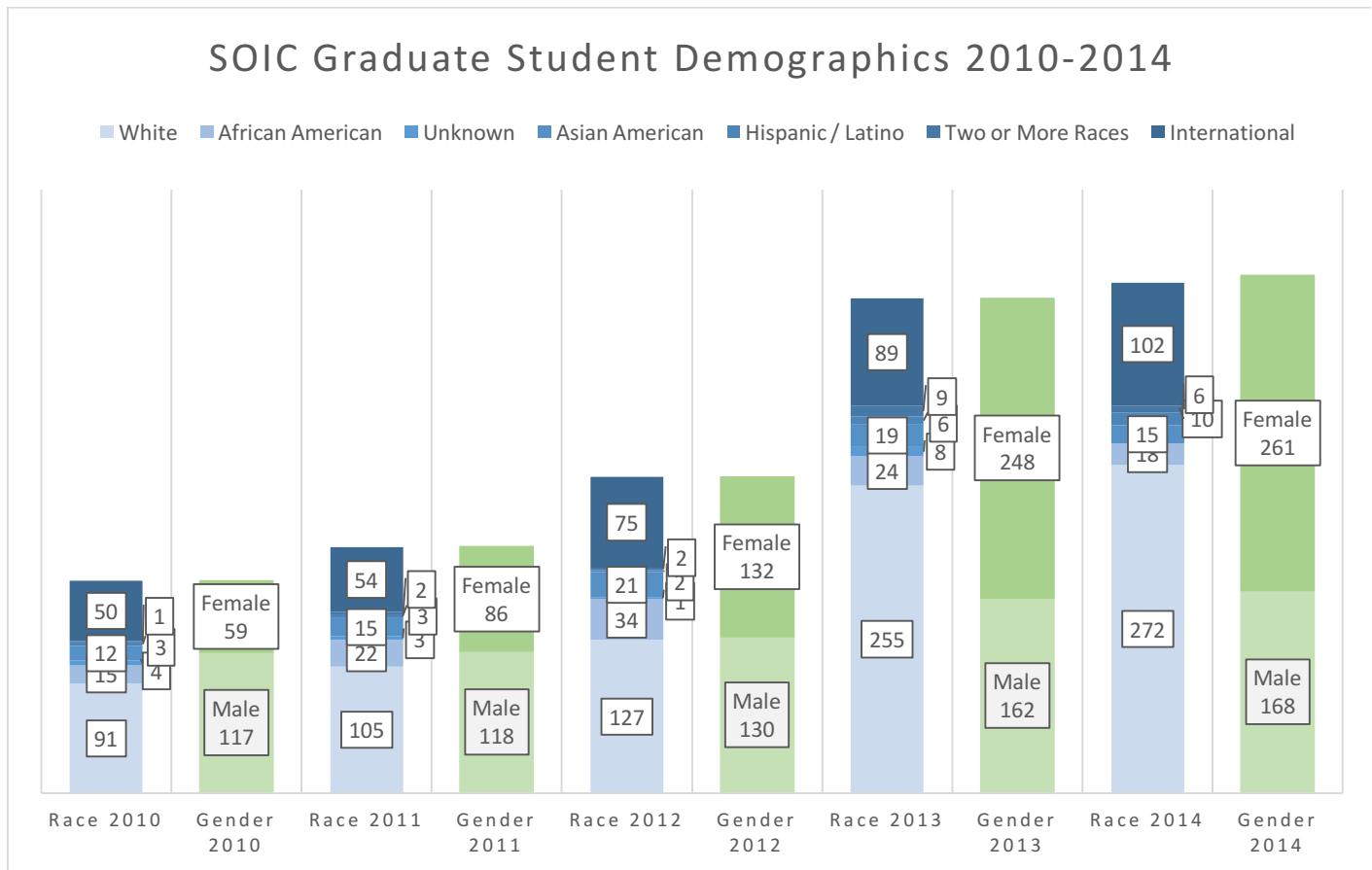
and ILF to promote our degree programs to a specialized audience. The Graduate Program Coordinator, faculty, and current students all assist in representing the school at these conferences to recruit attendees. The Graduate Program Coordinator and Executive Associate Dean recently completed a two-week graduate recruiting tour in India. The two SoIC representatives reached students at 20 different colleges in five cities, making connections with principals and department chairs to increase international applicants. Throughout the semester, regular information sessions (in person and online) are available for prospective students coordinated by the Graduate Program Coordinator. With the assistance of the Marketing Director, online marketing has been used as a successful tool for some of the graduate programs, particularly the online MLS degree program in an effort to reach out-of-state applicants.

c. *Types and levels of financial assistance available.*

See Appendix C for School of Informatics Financial Assistance for full-time graduate students.

d. *Numbers/percentages of women, minorities, international students in the population of majors. Description of any special programs to recruit minority students.*

The chart below represents the demographics of SoIC graduate students in the past five years.



2. Student Support

- a. *Description of student course placement procedures, orientation, advising, tutoring, mentoring, monitoring of progress, out-of-class contact with faculty, involvement in research and independent study, internships/field experiences, professional organizations and clubs, and other out-of-class learning opportunities.*

New graduate students are advised by the Graduate Program Coordinator on the classes to enroll in based on the plan of study for their program. For subsequent semesters, students follow the plan of study and also discuss with their academic advisor regarding course selection. Graduate students are required to attend a graduate orientation before they begin coursework where policies and procedures are discussed. The orientation also gives new students the opportunity to meet their peers, faculty, and staff. All international students are required to attend a comprehensive weeklong orientation organized by the Office of International Affairs during the week before their first semester. Students are able to interact with faculty as graduate or research assistants starting as early as their first semester. Departments also have informal opportunities where students and faculty get together to share research interests, learn from one another, and receive feedback. These opportunities are available two to four times per month, and all students and faculty are invited. All students have the opportunity to take independent study courses with faculty members as part of their plan of study. Master's students are encouraged to work with faculty in research labs and as research assistants and PhD students begin assisting with research during their first semester. Internships are an option for all programs and are encouraged to gain additional industry experience. The career services department assists students through this process.

- b. *Evidence that remedial requirements by the department in mathematics, reading, and English are appropriate and increase the likelihood of student success in departmental courses.*

All international graduate students are required to take an English for Academic Purposes (EAP) placement test during their orientation. Based on the test, a course or two may be required for the student to complete. The courses are *Academic Reading and Writing* and *Communication Skills*. If one of our students should be placed in a remedial course, we require the course to be completed in their first two semesters, which increases their chances of success in our program.

- c. *Opportunities for student involvement in program planning and evaluation.*

At the end of each semester, students anonymously fill out course evaluations, giving feedback on their experiences in their courses. These course evaluations are reviewed for the school by the Associate Dean of Academic Affairs and for each department by the department chair. The chair addresses issues with individual faculty, the relevant program director, and/or advisors, as appropriate. The Associate Dean addresses broader issues, such as those involving academic policy, through the Academic Affairs Committee and Faculty Council. Students also have the opportunity to provide feedback on an annual student satisfaction survey on their overall experience in the program. The advisors read these responses and make changes as appropriate. Advisors also reach out to all students who received a D, F, or W at the end of each semester to receive feedback on why the

student struggled in the course. All of the responses gathered are closely reviewed and changes are made when appropriate.

d. Description of efforts to support entering students.

The departments hold social events where all students can get together and share their thoughts about the first month of classes. This is an opportunity to discuss any problems that students may be facing with their peers and faculty mentors.

e. Description of research opportunities for graduate students. What opportunities are there for students and faculty to discuss their research either formally or informally? How are graduate students encouraged to attend national/international research meetings?

There are multiple opportunities for graduate students to be involved in research. All funded PhD students are paired with a faculty member during their first semester to assist them in their research. During their time, they also have to complete six credits of research rotation and have the opportunity to work with different faculty throughout their studies. Master's students are encouraged to work as research assistants for the faculty. The HCC Department hosts weekly Brown-Bag meetings where students and faculty have the opportunity to discuss their research, possible collaborations, and other topics of interest (publication proposals, national conferences, etc.) in an informal session. The BHI Department has one and three-credit hour graduate seminars with guest speakers and work-in-progress meetings for graduate students. There are also schoolwide research colloquia and distinguished speaker series.² Graduate students are granted travel funds to attend national and international research conferences for students presenting a peer-reviewed, authored research paper or poster prepared in the context of the student's academic studies. Students are informed of the major research conferences in via email and through their courses.

f. Description of how and when advisory committees are selected or assigned for graduate students.

PhD students work with their respective program director or department chair to select members for their advisory committee in the first year of their PhD program. The advisory committee must include at least two members from the major area and one from another. At least two members of the advisory committee must be members of the graduate faculty. The advisory committee approves the student's program of study and advises the student until the passing of the qualifying examination. A form is submitted for record keeping to the Graduate Program Coordinator once the advisory committee is confirmed.

g. How and when are research advisors selected for graduate students?

For the Bioinformatics program, it is a dual selection process. The students can propose research advisor(s) in their application and during their studies and students have the flexibility to switch their advisor with justified reason. The advisors also have the freedom to select the students based on their research needs and the student's qualifications. Once both parties agree, the student-advisor relationship is established.

² <http://soic.iupui.edu/research/colloquia/>

For the Health Informatics program, master-level students select a research advisor independently based upon their own interests; this selection is typically performed in the third semester of study, prior to the student's capstone or thesis (depending on which option he/she selects). Department faculty, if requested, will assist master's students with the selection of their research advisors.

PhD students are informed of the assignment of initial informal research advisors in their stipend package. Assignment is based primarily on the student's research interests as outlined in his or her graduate school application, and the PhD student is contracted to work in his or her advisor's field of research.

PhD students are then allowed to select their advisor, based upon research interests, after their first year; alternately, they have the choice of continuing with their first-year assigned advisor. PhD students are also responsible for selecting advisors for their research rotations and an advisory committee for their dissertation. As with master-level students, all department faculty are available to students to assist in selecting the appropriate research advisor.

For the LIS program, advisors are assigned on the student's application essay regarding their areas of interest. Students typically do not engage in research as it is not a degree requirement.

h. Description of how graduate students are advised for placement.

The students can access the faculty research from the school's website. During the graduate student orientation, all faculty will meet with students face-to-face to discuss their research and the students have the freedom to ask questions. Then the students can make individual appointments to meet the faculty for further discussion.

i. Description of special programs to advise graduate international students.

The Office of International Affairs has advisors to assist international graduate students in addition to the resources found in the school.

j. When do international students take additional English courses recommended following the EAP test?

Ideally, graduate students take the suggested courses during their first semester. If they cannot take them during the first semester, they are required to take them during the second semester.

k. Description of processes to help graduate students learn to teach.

Admitted master's students are vetted and selected to serve as Research or Teaching Assistants based on the interests of the students, their self-report skillset, and the needs of the department. Routinely, from the first semester of admission, every full-time MS student is assigned a teaching or research assistantship (funded by the department) to assist faculty in MAS undergraduate courses and a faculty mentor (the course instructor) who directly supervises their work. Most MAS MS students are assigned a Teaching Assistantship of 5, 10, or 20 hours per week mainly based on the number of undergraduate students in the courses and the skillset of the teaching assistant. Specific attention is paid every semester

to monitor the teaching performance of the teaching assistant by engaging faculty to assign students increasingly challenging teaching roles (from grading, to class supervision, preparation and logistics, to student interaction, tutoring, coaching and lecturing) and to provide feedback to the student and to the chair. Students are encouraged to take advantage of the Center for Research and Learning on campus to hone their communication and teaching skills.

For Bioinformatics, a student can become a teaching assistant in the department to familiarize himself/herself with the course content. The student can then be a co-instructor of a course that the student has excelled in and finally, he/she can be the instructor for undergraduate courses.

- l. *Description of how graduate students advance to candidacy for doctoral degrees.* Following the passing of the qualifying examination and the completion of all course work, the student's advisory committee will submit a Nomination to Candidacy Form to the University Graduate School through the Graduate Program Coordinator. Upon approval of the University Graduate School dean, the student will be admitted to candidacy.

- m. *Description of how and when graduate students select a thesis committee.* Master's students completing a thesis will create a thesis committee by the end of their second semester. The student first finds a thesis advisor with the help of the department chair. The Thesis Committee must have at least three members, including the thesis advisor, who serves as chairperson.

PhD students creating a research committee first choose a professor who will agree to direct the dissertation (usually the chairperson of the committee). Two or more additional faculty members from the major department, and a representative of each minor are required to complete the Research Committee. The committee is selected from the members of the graduate faculty who are best qualified to assist the student in conducting the research for the dissertation. All members of a research committee must be members of the graduate faculty. At least half of the members of the committee must be members of the graduate faculty with the endorsement to direct doctoral dissertations; others may be regular members. After consultation with and approval by the dissertation director and research committee, the student will submit to the University Graduate School a one- or two-page prospectus of the dissertation research. The membership of the research committee and the dissertation prospectus must be approved by the University Graduate School at least six months before the defense of the dissertation.

- n. *Description of how the department monitors each graduate student's progress.* At the end of each semester, the Graduate Program Coordinator, reviews graduate student grades and alerts program directors to any student's that may be having problems. Students, faculty, and advisors can view the student Academic Record Report at any time to view what classes have been taken and what classes still need to be taken. PhD students are tracked closely and reviewed at the end of each academic year to assess student progress.
- o. *Description of how students are selected to be teaching assistants.*

For Bioinformatics, the teaching assistant must be able to speak English well, have strong communication skills, be very familiar with the course contents, have a willingness to teach, and be committed to student advising.

In Health Informatics, the structure of the program requires full-time master's students to act in some capacity as teaching assistants (TAs). Selecting students' TA course placements and capacities is initially the responsibility of the student's initial academic advisor, assigned upon acceptance of admission. Assignment to TA positions is based upon the student's personal strengths.

PhD students may also function as advanced-level TAs after the passage of their qualifying examinations (typically held after the second year of the PhD program). PhD teaching assistantships are not offered to all PhD students and require much more responsibility than those assigned to master-level students. PhD students who are offered and complete their initial teaching assistantship may be assigned to be full adjunct instructors if their skills warrant.

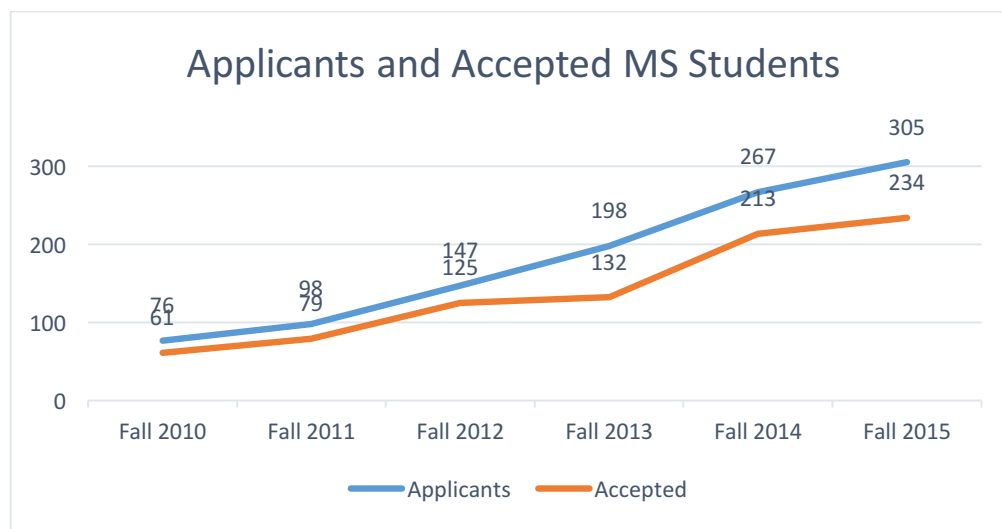
LIS students are not qualified to be teaching assistants within the program. All courses are at the graduate level, and there are no doctoral students.

Outcomes of Graduate Students:

1. Indicators of Program Quality

a. Evidence of student demand for entry/transfer into the program.

Each year our applicant pool increases for the graduate programs so the programs are able to choose higher caliber students. In the PhD program, there are approximately 50 applicants in which only four to six students per year are chosen.



b. *Number of graduates.*

Graduates	2010–11	2011–12	2012–13	2013–14	2014–15
Bioinformatics MS	5	8	9	15	16
Bioinformatics PhD	0	0	1	2	3
Chemical Informatics MS	1	1	0	0	0
Health Informatics MS	12	12	23	38	32
Health Informatics PhD	1	2	1	1	0
Clinical Informatics Certificate	6	4	11	9	1
Public Health Certificate	0	0	2	0	0
HCI MS	11	8	11	14	11
HCI Certificate	21	11	3	3	2
HIM Exchange Certificate	3	13	17	7	5
Health Information Security Certificate	0	5	6	1	0
Health Information Systems Architect Certificate	0	1	1	2	0
LIS MS	*	*	15	52	52

*LIS was not part of the School of Informatics and Computing during these years

c. *Evidence of student mastery of transferable skills (Principles of Undergraduate Learning and the Principles of Graduate and Professional Learning).*

PhD Students: The IUPUI principles of graduate and professional learning (PGPL), which guides mastery of transferrable skills and achievements of specific learning outcomes, state that “Graduate students earning an Indiana University or Purdue University PhD on the IUPUI campus will demonstrate... abilities related to the research focus of the degree.” (Source: IUPUI PGPL, 2011).

Three out of four of the PGPL’s are as follows: “Demonstrate the knowledge and skills necessary to identify and conduct original research [or similar original academic activities]”; “Think critically in creatively solving new problems within the discipline”; and “Conduct research in an ethical and responsible manner.” The PhD program requires both research assistantships, which are designed to chiefly include original research. The program also requires six credits of research rotations to broaden student’s interests in original research, and a full dissertation in an original research area. Mastery of high-level academic research skills carries a weight of between 30–40% of the PhD student’s final grade.

Ethics in research are extremely important, especially in health informatics, a field that often deals with federally protected private patient data. Ethical principles are created and

enforced by Indiana University's institutional review board (IRB) and federal (HIPAA) regulations; all studies conducted by PhD students must be in compliance with IRB and, if applicable, HIPAA regulations. Students found in violation in the conduct of their research may be subject to termination of support (e.g., research assistantship) and expulsion from the program.

The last PGPL states, "Communicate effectively high level information from their field[s] of study." High-level communication skills, both written and verbal, are cornerstones of essentially all PhD-level coursework and research (and, as of 2015, the PhD qualifying examinations, which are also required for the degree). Lower-level courses taken by PhD students also emphasize prodigious amounts of written communications (in the form of academic white papers and quality online forum discussions); verbal communication is emphasized in the form of presentations and talks, required in virtually every course at all levels. For PhD students, the pass rate (achieving a B- or higher) of all academic courses and research assignments approaches 100%, and in 2015, 80% of the ten written qualifying exam problems administered (given to five students) were passed at a score of 80% or higher. Students who fail to pass any part of the qualifying examination (e.g., breath, depth, and oral) on the first attempt lose school or departmental funding and those who fail any part of the qualifying examination on the second attempt are dismissed from the program.

The IUPUI PGPL also has similar stipulations for academic master-level degrees; in the Health Informatics department, the thesis option of the master's is an academic-type program. Master-level thesis track students, despite not being required to gain the breadth of research experience of their PhD peers, must still perform a full thesis, which requires approximately six credit hours of work (or consists of 17% of the curriculum). The lower-level courses taken by PhD students form the core of the master-level degrees, and master's students are therefore required to demonstrate similar levels of communication proficiency in their research activities. As with the PhD program, review of the literature is conducted extensively by master's students in Health Informatics, both as part of coursework, as well as part of their original theses. Master's students in the program are also held to the same ethical standards as PhD students, with expulsion possible for students who do not adhere to ethical research regulations and guidelines. Most master's-level students pass their thesis defense on the first attempt. The four principles for master's students are as follows: "Demonstrate the knowledge and skills needed to meet disciplinary standards of performance, as stated for each individual degree"; "Communicate effectively with their peers, their clientele, and the general public"; "Think critically and creatively to improve practice in their field"; and "Meet all ethical standards established for the discipline."

The Capstone/Project (C/P) track more closely mirrors IUPUI PGPL's conception of a professional master's-level program but also has elements of a traditional academic master's program. In lieu of an academic thesis, C/P track students pursue a similar research project at a non-academic venue. These venues include corporations, nonprofit organizations, and clinics throughout the region. Students in this track must also take one course on the business and organization of health information. With the skills learned in other master-level programs (outlined in the prior paragraph), students in the C/P track master effective communication skills in both research and professional realms.

For the MAS MS, primary learning outcomes include the acquisition of fundamental knowledge and research skills related to the study of existing digital media platforms and their societal impact, and the design and invention of novel media applications. The Media Arts and Science aspects of the program are tightly integrated: Research on the use of digital media complements the creation, design, and production of innovative digital experiences. Through the program, students conduct empirical research and research-based designs in the areas that interest them, such as digital media in healthcare, business, and education. The learning outcomes comprises both in-depth knowledge and skills in specific areas of digital production and comprehensive knowledge of most, if not all, digital production areas, such as 3D and 2D animation, video production, audio production, game design, and web design and development.

d. Evidence of student achievement of specified learning outcomes in the major.

Student achievement of the seven program learning outcomes for LIS is documented in two ways: mapping and the e-portfolio. Five of the program outcomes map onto specific courses. To graduate, student must achieve a B- or above in these courses. Grades of B- and above are defined as mastery of the course content and program objectives. Two of the program outcomes relate to technical competence and professional development. These occur within electives and are captured in the e-portfolio. This is the primary student-specific evaluation method.

The program also uses an e-portfolio in which students populate a matrix designed around the seven program outcomes. Periodically, faculty sample and rate the artifacts captured in these items, and in Summer of 2015, a panel of outside professionals rated and commented on a sampling of artifacts. This is the primary program-level evaluation method. Faculty use this data to inform course and program design.

Recent Capstone projects of HCI MS students (Spring 2015) include

- Ryan Ahmed, HealthTrack- A Health Mobile App
- Bunmi Akintomide, Achat: Your Fashion Shopping Buddy, Mobile App
- Malvika Bansal, Prox_ Rapid Information Propagation using Beacons, Ubiquitous Computing
- Yachung Cheng, Help2Buy- A Sharing Economy Service, Mobile App
- Michael J. Frontz, Art Fair Tracker: Juried Art Fair Application Management System for Artists and Fair Organizers, Website
- Xinxin He, Notes Hub, Website
- Dennis Leonardo, Patchwork: Collaborative Learning Hub, Website/Mobile App, collaborative learning
- Shivin Saxena, CulAmi: Smart Kitchen Experience using Touchless Interaction, Natural User Interfaces
- Daoyi Wang, Food Solution, Mobile App
- Ashleigh Young, Better Days: Mental Health Application, Mobile App
- Meng Zhang, Mappy: A collaborate navigation application, Mobile App

Student and faculty testimonials about secured internships, jobs in the major and connection to the industry practice:

<https://soic.iupui.edu/about/spotlights/reecha-bharali/>

<https://soic.iupui.edu/about/spotlights/ryan-sukale/>

<https://soic.iupui.edu/about/spotlights/mike-wilson/>

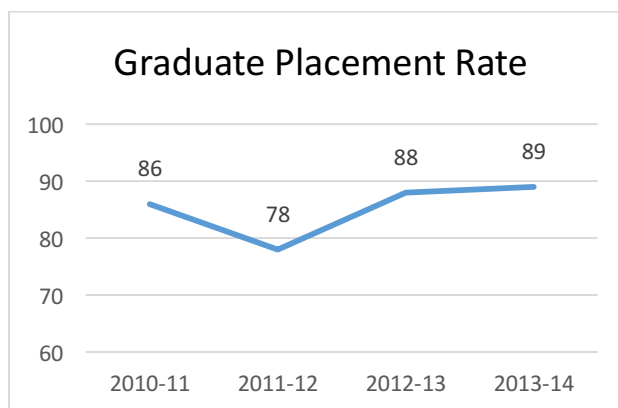
For evidence of student achievement of learning outcomes for MAS MS students, excerpt of recent Capstone projects include

- Asa Blevins, *Different Like Me*, Film, 3D, VFX.
- Nathan Pike, *Character Sculpting/Modeling Demo Reel*, Video and website
- Ryan C. Sellick, *Digital Media Marketing Campaign for Local Music Group*, Website, Video, Large Scale Graphic.
- Jonathan Sheldon, *The Effectiveness of Serious Gaming: Learning How to Calculate and Predict Slope*, Research project.

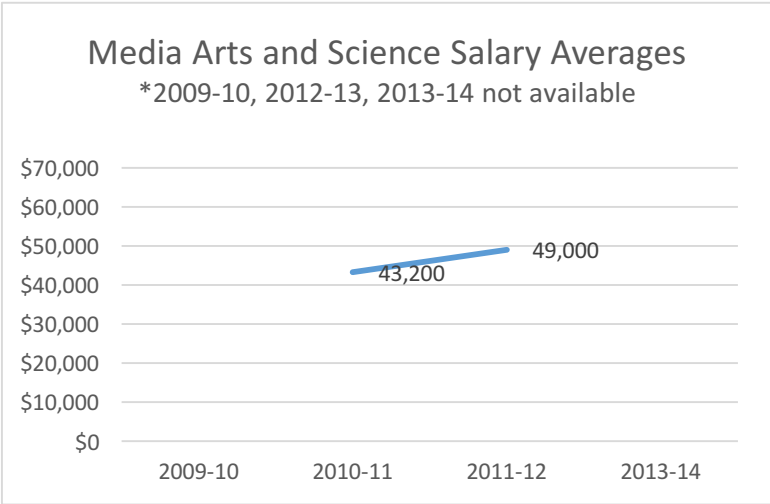
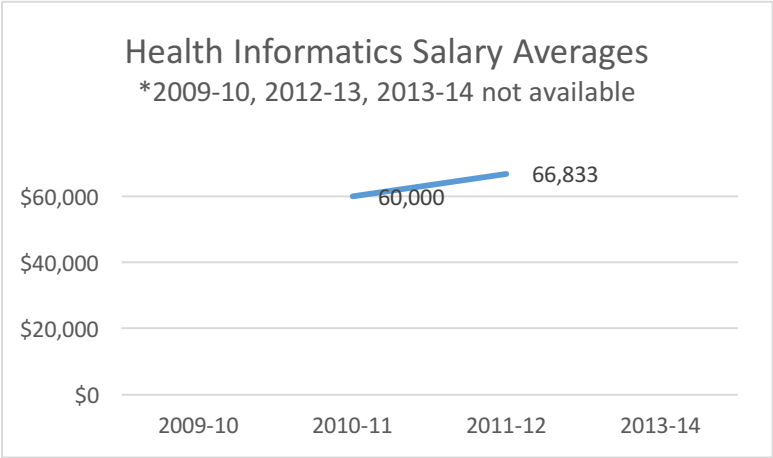
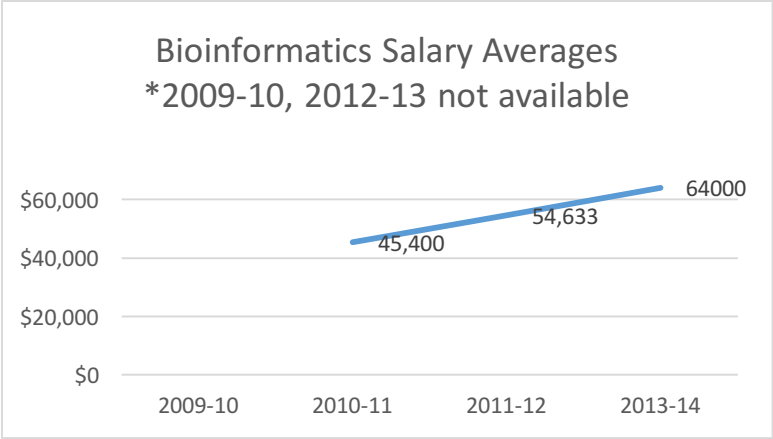
Selected student work can be found in the Media Arts and Science Student Work Gallery: <https://soic.iupui.edu/projects/>.

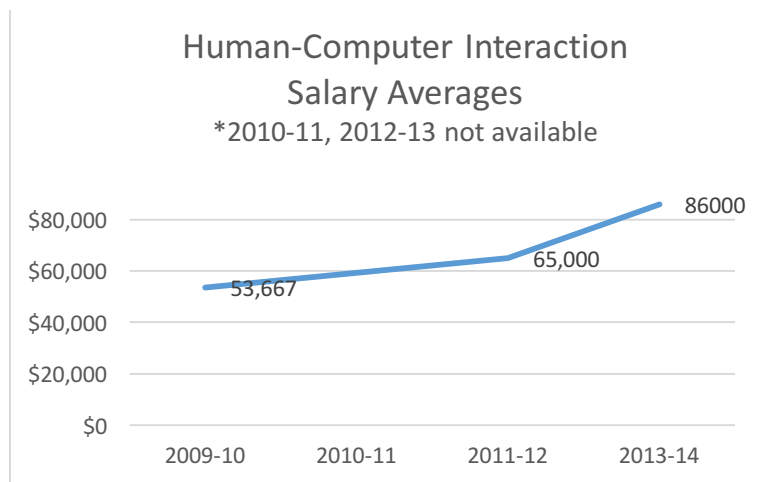
e. *Evidence of placement of graduate in employment in the field or in further education.*

The graph below provides historical placement data of undergraduate placement rate in full-time, graduate school, or internship positions in-major within six months post-graduation from the 2010-11 through 2013-14 (most current data). The data is collected via paper and electronic survey and other self-reported methods including LinkedIn and telephone calls.



The graphs below show salary averages from the past five years from each undergraduate program:





f. *Evidence of the placement of graduate students. List graduates by current position, title, and employing institution and identify mentor for graduate work.*

See Appendix G.

g. *Evidence of program quality derived from surveys/interviews of current students, graduates, employers, community members or agencies.*

Please see Section 1.i under Outcomes of Undergraduate Students.

h. *External recognition of students, faculty, or graduates including awards or honors and research awards.*

Evidence in achievement is seen by recognition by the university as the prestigious IUPUI University Fellowship is only awarded to approximately five incoming full-time PhD students at the entire university. In 2013, one of these Fellowships was awarded to an incoming Health Informatics PhD student. In the past five years, Health Informatics students have also been awarded extremely competitive internships at highly ranked companies such as Eli Lilly & Co., Covance Inc., and Roche Diagnostics LLC.

Three PhD candidates have received IUPUI's Elite 50 award: Hamed Abedtash, Health Informatics; Debaleena Chattopadhyay, HCI (Top in SoIC and Top 10 student in Elite 50); and Preethi Srinivas, HCI. Rajneesh Srivastava, PhD student in Bioinformatics, was awarded the John R. Gibbs Graduate Fellowship for Innovation.

Recent faculty and student highlights and achievements:

- Students Study Abroad in Paros, Greece – combining service learning, coursework and real-world experience.
<https://soic.iupui.edu/news/students-study-abroad-in-paros-greece-combining-service-learning-coursework-and-real-world-experience/>
- SoIC recognizes faculty for outstanding service and achievement.
<https://soic.iupui.edu/news/soic-recognizes-faculty-for-outstanding-service-and-achievement/>
- Production class wraps up Return of Aetheria game at PoPCon 2015.
<https://soic.iupui.edu/news/production-class-wraps-up-return-of-aetheria-game-at-popcon-2015/>
- First Annual High School Teacher Summit to Provide Hands-on Sessions Developing New Teaching Methods.
<https://soic.iupui.edu/news/first-annual-high-school-teacher-summit-to-provide-hands-on-sessions-developing-new-teaching-methods/>

- Summer workshops offer high school and middle school students an introduction to the future of technology.
<https://soic.iupui.edu/news/summer-workshops-offer-high-school-and-middle-school-students-an-introduction-to-the-future-of-technology/>
 - Students and faculty team up with IMA to bring exhibit to life.
<https://soic.iupui.edu/news/students-and-faculty-team-up-with-ima-to-bring-exhibit-to-life/>
 - Media Arts and Science Faculty Receives New Frontiers Grant for AMPATH Project.
<https://soic.iupui.edu/news/media-arts-and-science-faculty-receives-new-frontiers-grant-for-ampath-project/>
 - More student and Faculty Spotlights: <https://soic.iupui.edu/about/spotlights/>
1. *Publications by students in the program.*
Please see Appendix F.

Appendix A

Learning Outcomes for SoIC Programs

Health Information Management

(http://www.ahimafoundation.org/downloads/pdfs/2014%20Final%20Baccalaureate_Level_Curriculum_Map.pdf)

Informatics

1. **Technical Knowledge:**

- Demonstrate knowledge and skills in the mathematical and logical foundations of informatics, data representation, models, structures and informatics-centric management
- Define terms and explain basic principles essential to the design and development of IT and computing systems
- Acquire fundamental concepts and skills in software architectures and the development of information systems

2. **Social Dynamics of Informatics and Information Technology:**

- Understand and apply major societal trends affecting the development and deployment of modern day IT, such as access, privacy, intellectual property, security and others
- Critically analyze the impact of IT on individuals, groups and organizations at local and global levels
- Apply a user-centered approach to interaction design and product usability, including techniques for quantitative and qualitative testing of interface and interaction design
- Utilize digital tools to communicate with a range of audiences
- Analyze the social, cultural and organizational settings in which IT solutions will be deployed to achieve successful implementation

3. **Domain-specific* Critical Thinking and Problem Solving Skills:**

**Domains are areas of specialization that may include business, science, the arts or humanities.*

- Define terms and explain basic principles, concepts and theories from another domain or discipline in which IT skills will be applied
- Deploy IT resources in the context of another domain and/or discipline
- Synthesize, analyze and conceptualize information and ideas from multiple sources and perspectives
- Evaluate data, arrive at reasoned conclusions and solve challenging problems

4. **Collaborative Teamwork:**

- Select and effectively utilize oral, written, visual and quantitative communication skills within the context of an interdisciplinary team
- Identify and demonstrate the skills, behaviors and attitudes necessary to function as an effective team member, including working cooperatively with diverse group members
- Acquire the skills to initiate, manage and execute an IT project
- Articulate legal and ethical issues when using the creative work of others; respect the intellectual property of others

5. Professional Ethics and Development:

- Create a personal code of ethics; articulate principles for resolving ethical conflicts
- Commit to a regular program of continuing education and lifelong learning that is independent of employer sponsorship
- Participate in professional organizations that promote responsible computing and service to society

Media Arts and Science

1. Understand digital media and its effective use as a form of communication
2. Communicate ideas effectively in written and oral form to a range of audiences
3. Work effectively as a member of a team to achieve a common goal
4. Analyze a problem, identify and evaluate alternatives and plan an appropriate solution
5. Appreciate the history, theory and traditions of digital media. Evaluate media from multiple perspectives using the theories, concepts and language of digital media
6. Demonstrate mastery of the concepts, techniques and tools in one or more digital media specialties
7. Apply knowledge and skills to develop professional quality digital media productions in a timely manner and utilizing best practices and standards
8. Explain the impact of digital media on individuals, organizations and society
9. Acknowledge diverse opinions regarding professional, ethical, legal and social issues with a global perspective
10. Appreciate the need for lifelong learning and have a plan for continuing professional development

Master in Bioinformatics

1. Understand technology and computational techniques for data representation, information and knowledge in bioinformatics.
2. Demonstrate mastery of the core concepts of bioinformatics, including computational biology, database design and implementation, and probability and statistics.
3. Demonstrate the capability to understand, analyze and apply bioinformatics tools and skills in a professional environment via an industrial or academic internship in bioinformatics.
4. Cultivate bioinformatics solutions and communicate scientific information in written and oral form.
5. Extract information from different types of bioinformatics data (gene, protein, disease, etc.), including their biological characteristics and relationships.
6. Employ different data representation models and formats used for bioinformatics data representation, including markup languages such as SBML and CellML, and ontologies such as GO ontology.
7. Apply the different approaches used for data integration and data management, including data warehouse and wrapper approaches.
8. Master computational techniques and diversified bioinformatics tools for processing data, including statistical, machine learning and data mining techniques.
9. Analyze processed data with the support of analytical and visualization tools.
10. Carry out bioinformatics research under advisement, including systems biology, structural bioinformatics and proteomics.
11. Interact with non-bioinformatics professionals, such as biologists and biomedical researchers, to better understand their bioinformatics needs for improved support and service delivery.
12. Design and develop bioinformatics solutions by adapting existing tools, designing new ones or a combination of both.

Master in Health Informatics

1. Understand technology and methodologies for processing data, information, and knowledge in healthcare.
2. Assess and implementing information literacy for healthcare.
3. Manage effective information management.
4. Develop strategies for promoting adoption and effective use of health information technology.
5. Integrate data from disparate systems found in hospitals and clinics.
6. Implement standards and terminologies for documenting health events and exchanging protected health information.
7. Either individually or as a member of a group, use information effectively to accomplish a specific healthcare purpose.
8. Propose and justify decision support systems algorithm to support care delivery.
9. Integrate natural language processing (NLP) with standards and terminologies used in healthcare.
10. Evaluate outcomes of the use of information in clinical practice.
11. Assure confidentiality of protected patient health information and access control and the security of health information systems
12. Estimate the return of investment (ROI) of health information technology applications for healthcare.
13. Possess the skills as outlined in direct care component of the HL7 EHR model, such as navigation decision support, and output reports.
14. Understand the principles upon which organizational and professional health information system for providers and consumers are based.
15. Mine data from electronic health record (EHR) systems using advanced statistical and data programming techniques.
16. Design data models that integrate patient data from multiple sources to create comprehensive, patient-centered views of data.
17. Design an analytic strategy to frame a potential issue and solution relevant to the health improvement of patient populations.
18. Analyze the distribution of disease and health outcomes in relevant populations of interest (e.g., general population, health system members, patient subgroups).
19. Apply clinical analytics to various contexts of quality improvement (e.g., chronic disease, patient use, population health, public health).

Master in Human-Computer Interaction

1. Assess user needs and requirements.
2. Design and develop user design prototypes based on user assessments, while applying HCI principles and models.
3. Apply evaluation and usability testing methods to interactive products to validate design decisions using user testing and heuristic evaluation.
4. Categorize, design, and develop information in proper architectural structures.
5. Analyze test data and write a comprehensive report on the product development process of a redesigned interface, including the stages of pre-design, design, and post-design, testing, and data analysis.
6. Apply the research methods regarding qualitative and quantitative data.

7. Implement a HCI research proposal, including research questions, collecting the relevant literature, and methodology.

Master in Library Science

1. Approach professional issues with understanding
2. Assist and educate users
3. Develop and manage collections of information resources
4. Represent and organize information resources
5. Manage and lead libraries and other information organizations
6. Use research effectively
7. Deploy information technologies in effective and innovative ways

Master in Media Arts and Science

1. Design and create digital media products that are targeted to a specific purpose and that meet professional standards for quality
2. Plan a coordinated collection of multi-media or trans-media communications and/or experiences, using each medium to good advantage
3. Assess media communications and/or experiences, discriminating among features that influence effectiveness
4. Recommend strategies, practices and/or tools appropriate to a problem
5. Predict future trends and developments in digital media, based on examination of the history, tradition and current drivers in the field
6. Communicate in written and oral form to a range of audiences

PhD in Informatics (including three areas of specialization: Bioinformatics, Health Informatics and Human-Computer Interaction)

1. Identify, discuss and apply the fundamental concepts, theories and practices in informatics, such as information representation and architecture, retrieval, structured query language, information extraction and integration from disparate data sources, information visualization and security, and data mining tools and methodologies
2. Apply knowledge of beginning statistics, including sampling and correlations, research paradigms, distinctions and limitations of qualitative, quantitative and mixed method research designs, validity and reliability
3. Apply research proposals, conduct peer reviews, create an annotated bibliography, create and present a high-level presentation pertaining to research, and use SPSS
4. Acquire and apply the ability to read and critique scientific articles by analyzing the problem presented, solutions proposed and critically looking at the solutions/results, as well as learn how to organize and write a scientific article through critical thinking and discussion
5. Write research proposals by examining NSF and NIH case studies, including style and grant-specific requirements
6. Develop and deliver classroom lectures, including processes for critically evaluating classroom lectures and how to prepare effective teaching materials
7. Apply research methods and acquire advanced knowledge in different areas of research through apprenticeship and mentorship

Appendix B

School of Informatics at IUPUI Competitive Scholarships 2015-2016

Majors: INFO=Informatics HIM=Health Information Management MAS=Media Arts and Science

Scholarship/ Fellowship	Amount	GPA	Other Criteria
Health Information Technology Scholarship	\$500-\$1,000, not renewable	3.2	Supports a junior or senior majoring in INFO, HIM, or MAS with an interest in health information technology. May be given to a student with a strong affinity for working in a health field through the study of informatics and the health sciences, health information administration, bioinformatics or media arts and science. Student demonstrates strong leadership qualities and a desire to pursue education beyond the undergraduate degree.
John R. Gibbs Undergraduate Scholarship/ Graduate Fellowship for Innovation	\$1,000, not renewable	3.5	One award is given to <i>either</i> an undergraduate or graduate student in the School of Informatics. Preference is given to those who have demonstrated or expressed a stated interest in innovation and entrepreneurship.
Dean's Advisory Council Senior Scholarship	\$1,000, not renewable	3.5	Supports a student of senior standing currently majoring in Informatics or Media Arts and Science. Student must have a record of innovation, community service or academic excellence. Student must also maintain his or her major in Informatics or Media Arts and Science throughout his or her senior year.
Transfer Student Scholarships	\$1,000, renewable	3.0	The School of Informatics and Computing offers a scholarship for qualified transfer students who are enrolling into the IU system with more than 15 credit hours from an outside institution. Students who transfer in with a minimum cumulative GPA of a 3.0 or more will be automatically awarded the scholarship upon admission, which is renewable for up to three years so long as the student completes a full course load each semester and maintains a cumulative GPA of a 3.0 or above.
Aspirations in Computing Freshman Scholarship	\$1,000, renewable	3.2	The scholarship is awarded to students who won the NCWIT Aspirations in Computing competition and are admitted directly to the School of Informatics and Computing at IUPUI. This scholarship is available to incoming female freshman for their computing-related achievements and interests. Awardees are selected for their computing and IT aptitude, leadership ability, academic history, and plans for post-secondary education. The scholarship is automatically renewed for up to four years of study with a GPA of 3.2 and continuous full-time enrollment.
RJE Knoll School of Informatics Internship	\$1,250	3.0	One award is granted annually to a full-time undergraduate student currently in the School of Informatics and Computing that has arranged an internship with both an Employer and SOIC Career Services. The student must have a record of academic excellence and a minimum GPA of 3.0 on a scale of 4.0. Students must fulfill the following requirements additional to the application to be eligible: <ul style="list-style-type: none"> Completion of the following courses: Informatics – I101, I201, I202, I210, I211, N299

			<p>Media Arts and Science – N100, N101, N102, N202, N299</p> <ul style="list-style-type: none"> Completion of the SOIC Credit Internship Application signed by employer and approved by the Career Services Office.
Major-Specific Awards			
Media Arts and Science			
Tyler R. Stull Memorial Scholarship	\$1,500, not renewable	3.0	Awarded to an undergraduate student of senior standing majoring in Media Arts and Science. Student must demonstrate significant talent and future career potential in the area of graphic or sound design. Preference given to students who are Indiana residents and demonstrate financial need.
The OfficeWorks/Tom O’Neill Scholarship	\$1,000, not renewable	3.5	This is awarded to an undergraduate student of senior standing majoring in Media Arts and Science. Special consideration will be given to underrepresented students, including but not limited to financially challenged students and students of a Hispanic background.
Health Information Administration			
Gertrude L. Gunn Memorial Fund Scholarship	\$1,000, not renewable	3.0	Available to students with junior or senior standing who have been admitted into the HIM professional program. The student must demonstrate academic excellence, a minimum GPA of 3.0, and financial need. Students should apply in the spring semester prior to their junior or senior year.

- Students **must** apply by the deadline. Late applications will not be considered by the Scholarship Committee.
- Students must enroll full-time to receive award.
- HIM students must be Fully Qualified and Unconditionally Admitted to receive the Gertrude L. Gunn Memorial Scholarship. If awarded a scholarship the student must continue to meet the requirements of the program (including but not limited to grade requirements for prerequisites, and admission and enrollment in the Fall semester to the HIM program) in order to receive the scholarship.
- For scholarships to be awarded to a junior, students should apply in the spring semester *prior* to junior year.
- For scholarships to be awarded to a senior, students should apply in the spring semester *prior* to senior year.
- For these awards, the application must be received by the deadline listed above.

School of Informatics at IUPUI Scholarship Committee – awrd@soic.edu

Appendix C

IU School of Informatics and Computing at IUPUI

Admission-based Scholarships for full-time* beginning freshmen who are Indiana residents (for tuition purposes)

Effective Fall 2015

Requirements	Campus Scholarship	Campus Scholarship Deadline	SOIC Scholarship (in addition to campus scholarship, upon admission to SOIC at IUPUI)
High School GPA 3.75 SAT 1250** or ACT 28	IUPUI Chancellor's Scholarship \$8,000/year up to 4 years	Dec 1***	\$2,000/year up to 4 years
	<i>Renewable with GPA of 3.3</i>		<i>Renewable with GPA of 3.3</i>
Valedictorian & Salutatorian****	\$5,000/year up to 4 years	Feb 1	\$2,000/year up to 4 years
	<i>Renewable with GPA of 3.0</i>		<i>Renewable with GPA of 3.0</i>
High School GPA 3.5 SAT 1200** or ACT 26	IUPUI Dean of Faculties \$4,000/year up to 4 years	Feb 1	\$3,500/year up to 4 years
	<i>Renewable with GPA of 2.75</i>		<i>Renewable with GPA of 3.0</i>
High School GPA 3.25 SAT 1150** or ACT 25	IUPUI Academic Honors \$1,000/year up to 4 years	Feb 1	\$1,500/year up to 4 years
	<i>Renewable with GPA of 2.75</i>		<i>Renewable with GPA of 3.0</i>
High School GPA 3.0 SAT 1070** or ACT 23		rolling	\$1,500/year up to 4 years
			<i>Renewable with GPA of 3.0</i>

* Students must maintain full-time student status each semester to receive the scholarship.

** Critical Reading/Verbal + Math section only. Writing scores are not factored for consideration.

*** Students who miss the campus Dec 1 deadline may still be eligible for the IUPUI Dean of Faculties and SOIC scholarships.

**** Students who also meet the Chancellor's Scholarship criteria will receive an additional \$4,000 for a total of \$9,000 annually.

Students who have applied for admission as incoming freshmen for the following Fall by the deadline indicated and meet eligibility requirements will automatically be considered. No separate application is required.

An award recipient may hold only one admission-based scholarship funded by the SOIC.

IU School of Informatics and Computing at IUPUI
Financial Assistance for full-time* graduate students

Effective Fall 2015

Requirements	GPA	Time period	Resident	Criteria for renewal
MS student in BIO, HI, HCI, MAS	3.0	4 semesters maximum	\$500/ sem (resident) \$3,000/sem (non-resident)	continued full-time enrollment, regular attendance at School colloquia series, satisfactory performance and general satisfactory progress toward completion of master's or doctoral degree studies
PhD student in BIO HI HCI	3.0	Duration of doctoral studies	Tuition remission for 90 credit hours total	

* *Masters students must be enrolled in a minimum of 8 credit hours or more each semester to be considered full-time and receive the scholarship.*

PhD students who are employed as graduate assistants working 20 hours per week must be enrolled in a minimum of 6 credit hours to be eligible for tuition remission. Courses must count toward the completion of the degree.

Appendix D

Student Groups

of

Informatics and Computing

<p>ACM SIGGRAPH SIGGRAPH IUPUI Student Chapter is dedicated to furthering the knowledge, excitement, and creativity of its members. Typically members are interested in graphics, interactive techniques, or computer animation. Contact: facebook.com/SIGGRAPH</p> <p>ALISS (Assoc. for Library and Information Science Students) ALISS works to supplement the educational, professional, and networking needs of SLIS students while building a sense of community within the program and providing opportunities to make an impact in Indianapolis. Contact: facebook.com/iupuialiss</p> <p>Anime A group dedicated to spreading and sharing the benefits of anime to other people on Campus. They showcase both subbed and dubbed anime based on preference. Contact: facebook.com/groups/IUPUISAnimeClub</p> <p>Concept Art Society A place where concept artists can come together and learn art in an inspiring environment. Contact: facebook.com/ConceptArtSociety</p> <p>Cosplay Club at IUPUI The IUPUI Cosplay Club is dedicated to the creation and discussion of costumes and prop making. Members can come to work on their projects, meet others with a passion for cosplay, pick up a few tips, or just hang out. Contact: facebook.com/groups/iupuicosplay/</p> <p>F.U.N. (Fandom United Network) A group of people who like different TV shows, movies, or other forms of media discussing topics centered around the symbolism in media and how they reflect upon the modern cultural mindset. Contact: facebook.com/fandomunitednetworkIUPUI</p> <p>Game Developer's Group This group is for dedicated students who want to advance their skills in game development with hands on exposure to the medium. Meetings are focused on learning, creating, and critiquing. Contact: facebook.com/GameDevIUPUI</p> <p>Gamers' Guild at IUPUI The Gamers Guild at IUPUI is a place where you can kick back, relax, and enjoy some gaming to take a break from your stressful academic life. No fees, no requirements to attend, just fun. Contact: facebook.com/GGIUPUI</p>	<p>HIA Connection The Health Information Administration (HIA) Connection allows students to network and experience resources pertinent to the health information field. Contact: facebook.com/soichiaconnection</p> <p>Informatics Student Government (ISG) Informatics Student Government (ISG) is the governing organization for student clubs and activities within the School of Informatics and Computing. It is comprised entirely of students. Contact: www.iupui.edu/~isg/</p> <p>MacGuffin Media (MacMedia) MacGuffin Media (MacMedia) is an IUPUI student organization dedicated to providing any and all students with the opportunity to become involved in the various aspects of media, including (but not limited to): Film Production, Audio, 3D, Scriptwriting, etc. Contact: facebook.com/MacMediaIUPUI</p> <p>Mobile App Developers at IUPUI (MAD) The Mobile App Developers organization at IUPUI's primary purpose is to facilitate and promote a community of mobile application developers at IUPUI. Members will gain hands on experience working in the app development pipeline. Facets of development include programming, design, asset creation, and quality assurance testing. No experience is required to join. Contact: Michael.Auer-miauer@iupui.edu</p> <p>Ohmmscient Audio Collective The Ohmmscient Audio Collective is an audio based organization that focuses on enhancing and expanding their technical prowess in regards to anything audio related. Contact: facebook.com/ohmmscientaudiocollective</p> <p>STARS (Students & Technology in Academia, Research, and Services) The mission of the STARS Alliance is to increase the participation of women, under-represented minorities and people with disabilities in computing disciplines through multi-faceted interventions Contact: facebook.com/groups/IUPUIStars/ Vicki.Daugherty-vdaugh@iupui.edu</p> <p>Women in Technology (WIT) Women in Technology (WIT) is dedicated to improving community by empowering women from all disciplines to utilize technology to make a difference. Contact: www.iupui.edu/~getwiti</p>
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If you are interested in any of these groups, feel contact them through the Facebook or web page listed above or visit: soic.iupui.edu/about/student-groups/

Appendix E

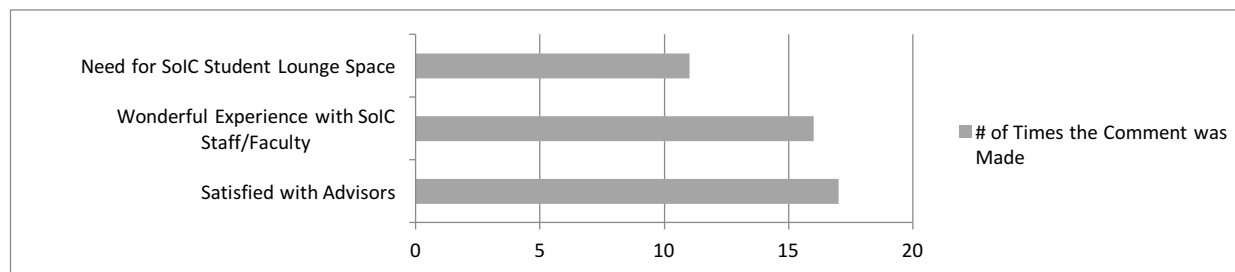
SoIC Student Satisfaction Survey FY 14/15

In April 2015, we sent out the annual student satisfaction survey asking undergraduate students to rate on a scale of 1 to 5 the level of importance and level of satisfaction on various aspects of their college experience. This is the second time we have implemented the survey. The first time we surveyed the students in 2014, we received a total of 58 responses; this year, we received 109 student responses. The increase in student participation is believed to be credited to the following changes: survey awareness, verbiage in the email sent out asking for participation, and students realizing that changes are made based on the survey results.

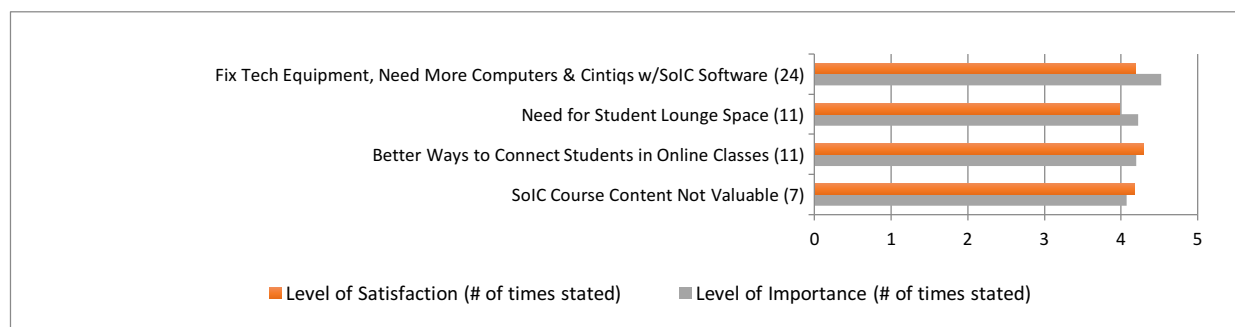
The results allow us to see the top areas that are most important to students and evaluate the students' level of satisfaction in each of those areas. Below is a chart showing these top areas and compares the 2015 level of satisfaction to the 2014 level of satisfaction. As the chart shows, the satisfaction level increased in each of these areas from 2014 to 2015.



The survey also allows us to see the comments that students provide. Below is a chart showing the most commonly provided comments.



The survey also allows us to see the main concerns of the students. Below is a chart showing the most commonly stated concerns.



Attached is a document showing the demographics of the students who participated, all questions, their rankings in importance and satisfaction, as well as comments provided by the students.

Appendix F

Publications of SoIC Students

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Appendix G

Reported Graduate Placement Data Spring 2011-2014						
First Name	Last Name	Year	Level	Degree	Company	Position
Prudhvi	Mummaneni	2011	MS	Bioinformatics	Thomas Jefferson University	Bioinformatics Programmer
Satishkumar	Ranganathan Ganakammal	2011	MS	Bioinformatics	Center for Disease Control	Scientist (Mid-Bioinformatician)
Anusha	Nagari	2011	MS	Bioinformatics	Lee Kraus	Computational Biology
Sriya	Bolleni	2011	MS	Bioinformatics	ePeople Tech	Database Intern
Rini	Pauly	2011	MS	Bioinformatics	Vanderbilt University Medical Center	Bioinformatics Engineer -I
Gokhul	Kilaru	2011	MS	Bioinformatics	NIH - Natl Inst of Allergy and Infectious Diseases	Computational Biologist & Nex-Gen Seq Data Analyst
Brian	Dixon	2011	MS	Health Informatics	Enrolled in a program of continuing education	IU School of Informatics
Loretta	Amadi	2011	MS	Health Informatics	Healthcare Partners of Nevada	Business Systems Analyst III
Nicholas	Stepp	2011	MS	Health Informatics	Ivy Tech Community College	Faculty / Professor
William	Fulton	2011	MS	Health Informatics	National Trade Supply	Director of Marketing
Brian	Beaman	2011	MS	Health Informatics	Ascension Health Information Services	QUEST Product Manager
Andrew	Puchle	2011	MS	Human-Computer Interaction	IU Kelley School of Business	Developer
Dennis	Mann	2011	MS	Human-Computer Interaction	Eli Lilly	Business Integrator
Craig	Stanley	2011	MS	Human-Computer Interaction	Butler University	Systems Engineer
John	O'Haver	2011	MS	Human-Computer Interaction	Zesco	Web Content Manager
Fenrick	James	2011	MS	Human-Computer Interaction	Department of Workforce Development	System Administrator
Yi-Jen	Lai	2011	MS	Human-Computer Interaction	KatDe Incorporation	Visibility Engineer
Sepideh	Ansari	2011	MS	Human-Computer Interaction	CourseNetworking	Director of UI Design

Scott	Russell	2011	MS	Human-Computer Interaction	Roudebush VA Medical Center	HCI & Simulation Lab Administrator
William	Barnes	2011	MS	Media Arts & Science	Indiana Public Health	Education Support Tech
Angelica	English	2011	MS	Media Arts & Science	Lux Premiere	VP/Creative Director
Muhammad Taha	Khan	2011	MS	Media Arts & Science	The Basement	Flash Developer
Kellie	Welborn	2011	MS	Media Arts & Science	Kellie Welborn Enterprises, LLC	Owner
Antonio	Singleton	2011	MS	Media Arts & Science	Schneider Corp	Senior Software Engineer
Carrie	Rector	2011	MS	Media Arts & Science	IU Health	Developer
Erica	Gilbert	2011	MS	Media Arts & Science	IU Division of Continuing Studies	Web Designer
Phillip	Alexander	2012	MS	Bioinformatics	IUPUI Center for Comp. Biology	Bioinformatics Research Analyst
Shreyas	Karnik	2012	MS	Bioinformatics	University of Wisconsin, Marshfield clinic	Programmer/Analyst
Yogesh	Pandit	2012	MS	Bioinformatics	Northwestern University	Bioinformatician
Madhankumar	Sonachalam	2012	MS	Bioinformatics	Cognizant Technology Solutions	Technology Leader
Kanishka	Jain	2012	MS	Bioinformatics	JP Morgan Chase	Information Analyst
Hrishikesh	Lokhande	2012	MS	Bioinformatics	IU School of Medicine	Data Analyst/Scientific Programmer
Derick	Witty	2012	MS	Chemical Informatics	Covance	LIMS Database Administrator
Kelly	Carman	2012	MS	Health Informatics	St. Fransiscan Health	Epic Testing Analyst
Christopher	Kiess	2012	MS	Health Informatics	Avanade	UX Designer
Stephen	Brown	2012	MS	Health Informatics	RTI International	Health IT Scientist
Wei	Kong	2012	MS	Health Informatics	Citive Group	EMR Analyst
Alex	Eades	2012	MS	Health Informatics	IU Health	Decision Support Analyst
Uche	Unogu	2012	MS	Health Informatics	IU Health	Systems Specialist
Lynn	Vincz	2012	MS	Health Informatics	WellPoint	Clinical Consultant
Paul	Glascock	2012	MS	Health Informatics	St. Vincent Hospital/Ascension Health	EMR Implementation Support Analyst

Jeanne	Ballard	2012	MS	Health Informatics	Regenstrief Institute/HealthNet	Medical Informatics/OB/GYN
Judy	Gichoya	2012	MS	Health Informatics	Indiana University School of Medicine	Radiology Resident
Wendy	Harrold	2012	MS	Health Informatics	State of Indiana	Assistant Deputy Director, IT and Reporting Services
Timothy	Imler	2012	MS	Health Informatics	Indiana University School of Medicine	Gastroenterology and Medical Informatics Fellow
Joshua	Jonte	2012	MS	Health Informatics	Angie's List	Software Architect - Finance Team
Christopher	Kiess	2012	MS	Health Informatics	GN Resound	UX Designer
Amrita	Parikh	2012	MS	Health Informatics	St. Vincent Hospital	Senior System Analyst
Jeanette	Vaughan	2012	MS	Health Informatics	Contract Consultant	Contract Consultant
Christopher	Sleppy	2012	MS	Human-Computer Interaction	Ivy Tech Community College	Assistant Director of Institutional Research
Joseph	Hughes	2012	MS	Human-Computer Interaction	American Health Networks	Help Desk Coordinator
Christopher	Vaulter	2012	MS	Human-Computer Interaction	Shape Learning	Creative Director
Erik	Schlegel	2012	MS	Human-Computer Interaction	RATIO Architects, Inc.	Systems Administrator
Bradley	Nielsen	2012	MS	Human-Computer Interaction	ACES Power Marketing	Software Developer
Scott	Cooper	2012	MS	Media Arts & Science	IUPUI	Research Associate
Joseph	Kemp	2012	MS	Media Arts & Science	Boss Dog Studios	Audio Engineer and Multimedia Producer
Christopher	Bradley	2012	MS	Media Arts & Science	Indianapolis Fruit Company	Web Developer
Chauncey	Frend	2012	MS	Media Arts & Science	IUPUI	Analyst/Programmer
Carla	Happel	2012	MS	Media Arts & Science	Herff Jones	Technical Writer
Joan	Savage	2012	MS	Media Arts & Science	Dept. of Veteran's Affairs	Program Manager
Christopher	Hughes	2012	MS	Media Arts & Science	Department of Veteran's Affairs	Principal of UX & Service Design Strategy
Kenneth	Spry	2012	MS	Human-Computer Interaction	Regenstrief Institute	Human-Computer Interaction Specialist

Eric	Cox	2012	MS	Human-Computer Interaction	Indiana University School of Medicine	Systems Applications Administrator
Thint	Cho	2012	MS	Media Arts & Science	IUPUI (CIS, CIT, and Comm Studies)	Adjunct Faculty
Ellis	Gary	2012	MS	Media Arts & Science	LIDS Sports Group	E-Commerce Programmer
Xian	Guan	2012	MS	Media Arts & Science	Purdue School of Eng. & Tech. IUPUI (CGT department)	Visiting Lecturer
Brett	Marshall	2012	MS	Media Arts & Science	Sogeti	Consultant
Amber	Pratcher	2012	MS	Media Arts & Science	IUPUI	Senior Asst. Director of Scholarships
Evan	Roberts	2012	MS	Media Arts & Science	McGraw-Hill Higher Education	Creative Analyst
Abhinita	Subhadarshini	2012	MS	Bioinformatics	Mayo Clinic	Informatics Specialist
Chris	Bennett	2013	MS	Health Informatics	IU Health	Cerner Application Support Analyst
Jason	Cadwallader	2013	MS	Health Informatics	Indiana University School of Medicine	Asst. Professor/Lecturer
Jordan	Lambert	2013	MS	Health Informatics	Franciscan Alliance	Technical Analyst
Rebecca	Lowry	2013	MS	Health Informatics	IU Health North Hospital	Clinical IS Coordinator
Andrew	Meyerhoff	2013	MS	Health Informatics	Computer Task Group	Software Engineer
Gregory	Schaefer	2013	MS	Health Informatics	Community Health Network	IT Site Director
Jianmin	Wu	2013	MS	Health Informatics	Indiana University School of Medicine	Assistant Research Professor of Surgery
Priyam	Mathur	2013	MS	Health Informatics	Beth Israel Deaconess Medical Center	Data Analyst
Rita	Rogers	2013	MS	Health Informatics	UnitedHealthGroup	Sr. IT Project Consultant
Kecia	Woods	2013	MS	Health Informatics	Indiana Health Information Exchange	Implementation Consultant/Project Manager
Laura	Schlenker	2013	MS	Health Informatics	IU Health	Manager, Clinical Informatics
Aswani	Kilaru	2013	MS	Health Informatics	Prime Healthcare Services	Clinical Systems Analyst
Chad	Naville	2013	MS	Health Informatics	Dept. of Veteran's Affairs/Computer Specialist - Beach Bum Cares	Pharmacist
Jason	Eggert	2013	MS	Human-Computer Interaction	National Trade Supply	User Interface/Conversion Rate Optimization Manager

Brian	Hansen	2013	MS	Human-Computer Interaction	Hansen Multimedia	Principal, Creative Director
Li	He	2013	MS	Human-Computer Interaction	Lextant	Human Centered Design Associate
Gisele	Lyons	2013	MS	Human-Computer Interaction	IU Health	Program Manager
Obed	Sai	2013	MS	Human-Computer Interaction	Kaplan Professional	User Experience Designer
Noelle	Webster	2013	MS	Human-Computer Interaction	Software Engineering Professionals (SEP)	Lead UX Designer
Lydia	Whitehead	2013	MS	Human-Computer Interaction	Small Box	Design Director
Samantha	Norling	2013	MLS	Library Science	Indiana Museum of Art	Archivist
Molly	Bowers	2013	MLS	Library Science	Orchard Software	Laboratory Information Systems Support Specialist
Stephanie	Murphy	2013	MLS	Library Science	La Porte County Public Library	Youth Service Manager
Jennifer	Herron	2013	MLS	Library Science	Cathedral High School	Librarian
Brandon	Dennett	2013	MS	Media Arts & Science	Zoic Studios	3D Generalist
Jay	Hardin	2013	MS	Media Arts & Science	Virtual Fireflies LLC	CFO
John	Hesch	2013	MS	Media Arts & Science	Quest Information Systems	Software Engineer III
Sacha	Pugh	2013	MS	Media Arts & Science	Ball State University	UI Designer
Adam	Keller	2013	MS	Media Arts & Science	KAR Auction Services	ITIL Solution Developer
Opeyemi	Oladapo	2014	MS	Bioinformatics	Fusion Alliance	Data Consultant
Bhargav	Pavuluri	2014	MS	Bioinformatics	New York Port Authority	Software Developer
Jeremy	Brewster	2014	MS	Bioinformatics	Eli Lilly and Company	Associate Consultant - Clinical Business Systems
Heng-Yi	Wu	2014	MS	Bioinformatics	School of Informatics and Computing IUPUI	Health Informatics PhD Student
Matthew	Segar	2014	MS	Bioinformatics	IU School of Medicine	Medical Student
Chaoxiang	Huang	2014	MS	Bioinformatics	Accord Investment Advisor	Database Analyst Intern

Lakshmi Vara Prasad	Koneru	2014	MS	Bioinformatics	Sigma-Aldrich	Bioinformatics Scientist
Aditya	Singal	2014	MS	Bioinformatics	Altima Technologies	Software Engineer
Aisha	Iftikhar	2014	MS	Health Informatics	Parkview Hospital	Health Informatics Intern
AuraLee	Lyons	2014	MS	Health Informatics	Franciscan Alliance	Clinical Informaticist
Kirsten	Van Hoy	2014	MS	Health Informatics	IU Health	Workforce Scheduler Systems Administrator
Anastasia	Miller	2014	MS	Health Informatics	University of Central Florida	PhD Program
Joshua	Petree	2014	MS	Health Informatics	(IHIE) Indiana Health Information Exchange	Software Quality Assurance Specialist
Cathy	Fulton	2014	MS	Health Informatics	Indiana University	Clinical Assistant Professor
Aeshvarya	Verma	2014	MS	Human-Computer Interaction	Demandware	UX Designer
Ryan	Sukale	2014	MS	Human-Computer Interaction	Yahoo	Front End
Stephen	Goforth	2014	MS	Human-Computer Interaction	ExactTarget	UX Researcher
Wei	Pan	2014	MS	Human-Computer Interaction	Citrix	Product Design Intern
Katherine	Manuel	2014	MS	Human-Computer Interaction	Safe to Drive	Web/Graphic Designer
Reecha	Bharali	2014	MS	Human-Computer Interaction	Yahoo Research	UX Designer
Tianjiao	Liu	2014	MS	Media Arts & Science	Telamon	Business Analyst
Staci	Dartis	2014	MS	Media Arts & Science	Gannett	Media Designer
Weizhi	Li	2014	MS	Media Arts & Science	8sian Media	UI/UX Designer
Petar	Stamenov	2014	MS	Media Arts & Science	Stringcan	Videographer

Appendix H

Video for Social Change

NEWM-N465

Final Reflection

After three years of college, I would have to say that my experience in this service-learning course will definitely stay with me for the rest of my life. Out of all of the classes that I have taken up to this point, this is the only class where I felt that the work I was doing amounted to more than just a grade or credit hours.

I learned that I am not averse to volunteer service. Admittedly, I probably would've never given the idea of volunteer service a chance if it hadn't been for this class. It certainly wasn't due to a lack of volunteer opportunities, as I have read hundreds if not thousands of fliers and emails for volunteer service from my time on the IU Bloomington campus and the IUPUI campus. I suppose that I just felt like I didn't want to volunteer for something only to find that I lacked the skills or teamwork necessary to be of any help. After taking this class I now have a better understanding of what I am capable of and how I can apply myself in a volunteer service setting.

The most important thing I learned about the community I served is that there are good people in this world that are doing great things. A person can read all of the work that they do and have done on their website, but I feel lucky to have had the privilege to work with them and have this experience. Listening to these women's stories has given me a deeper insight into how the Volunteers of America are helping them. The help that the VoA provides these people with goes beyond rehab programs or counseling. These women have told me stories of how they were able to reconnect with family that they haven't been in contact with for years with the help of the VoA. They told me stories of how people like Rachel Halleck have helped them cope with loss or addiction in their lives. They told me how wonderful it was that people like Sara Pugh would put in so much hard for the events that they would have, like Halloween and Christmas parties. From listening to these women's stories, I understood that the help that the VoA provides goes beyond the programs in the building. They have programs that provide school supplies and clothes for children with incarcerated parents. The VoA and every person in there goes above and beyond in the work that they do, and I feel lucky to have been given the chance to record the personal stories of a few of the women that have worked closely with the VoA.

The best thing that happened to me in this semester would have been getting to meet Sara Pugh. From the initial impression that Skip had given me on how the VoA might conduct itself similar to that of a prison setting, I will admit that I had gone in expecting a stern and authoritative environment. I was taken by surprise on how Sara truly was, and how the women had described everybody else that worked at the VoA. Now there are rules and regulations that are in place due to the nature of their work, but everyone that I had met there acted as if they were just talking to their friends. The VoA is a supportive environment, and it's people like Sara that make such an environment possible. Not to mention all of the work that Sara puts in at the VoA herself. Not only was she helping me with the project, she was also in the process of planning out parties for the residents and rebuilding the VoA of Indiana website. I admire how hard she works and how much work she puts into her job. And despite all of the work that she had,

she was still able to allocate some time for me and this project. I can't thank her enough for how helpful and kind she's been, and for allowing me to help her and the VoA this semester.

The worst part of this experience would have to be the rental cameras that I used. Having no equipment of my own, I decided to utilize the equipment rental service provided by the School of Informatics to ascertain the equipment I would need. I hate to admit it, but the first camera that I had received had been a little faulty. Despite all of my efforts, I couldn't get the camera to record without adding a bright yellow hue to the footage. And to only add to the misfortune, the second camera that I used for the second batch of interviews had not saved the footage properly. The video files were corrupted and completely unusable, and I had not known this until I had returned the camera and the footage was wiped from the SD card. I felt ashamed about this and wasn't sure how to tell Sara. Fortunately for me she wasn't upset at me from this turn of events. She told me not to worry about it as this has happened to her before, and that they could interview those women again at a later date with their own little camera. So in conclusion, I am grateful that the School of Informatics provides this equipment to be used by the students, but I also feel like I may have put too much faith into rental equipment.