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A COLLABORATIVE FORUM FOR THE DISTRIBUTION OF MULTIDISCIPLINARY
SCHOLARSHIP IN THE OPEN-ACCESS ENVIRONMENT: THE INCEPTION OF THE ADVANCED
AVIATION ANALYTICS INSTITUTE FOR RESEARCH (A³IR-CORE)

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Identifying the need for a multi-faceted, interdisciplinary research team to investigate various issues within the aviation industry, Purdue University's Department of Aviation Technology has organized the Advanced Aviation Analytics Institute for Research—A Center of Research Excellence (A³IR-CORE). A thorough meta-analytic review of collaborative network theory was the impetus for the organizational development of this forum. Focused on engaging a wide range of knowledge, talents, and experiences, this preeminent institute will fill the traditional void of academic material in the aviation industry by actively involving undergraduate students, graduate students, and faculty in a collaborative environment that increases the dissemination of research materials within the college and expands departmental recognition within the larger discipline. The flagship function of this group is to facilitate and manage research projects for departmental faculty—projects that will lead to publication at nationally and internationally recognized conferences and in peer-reviewed journals.

Scholarly progress hinges on the ability of researchers to establish connections and coordinate activity. The aviation community has in particular faced challenges in this area due to the large number of both academics and practitioners spread over various areas of the country. The Advanced Aviation Analytics Institute for Research—a Center of Research Excellence (A³IR-CORE) was established to foster a collaborative environment between scholars at all levels. The support of faculty research projects and publications are the flagship offerings of this group, leading to recognition in academic journals and at leading conferences around the world. Alluding to various existing scholarly publications, this paper intends to build support for the inception of a collaborative research group within the Department of Aviation Technology at Purdue University

Collaborative Network Theory

Ad-hoc collaborative networks of isolated researchers with other isolated researchers are the backbone of much scholarly research, but opportunities for advances can be lost without a formalized structure for cooperative work and information sharing. The creation of more formalized networks for research dissemination has proved beneficial in the past, notably with Saint Louis University's Safety Across-High Consequence Industries (SAHI) conference (Bowen, Block, & Patankar, 2009). The concept emerged as a group of interested individuals sharing information; the creation of a conference to facilitate this sharing process allowed many others to also benefit from the initial gains achieved in safety through such dissemination.

Formalized structures ensure that research ideas and techniques are captured and available for others to use. As described in Bowen and Lu (2004), this process enables synergistic relationships between researchers, regardless of their proximity.

Void of Academic Material

Aviation has traditionally struggled to find an appropriate outlet for collaboration on high-level research projects (Bowen, et al, 2011). A³IR-CORE aims to provide an avenue for faculty and students (both undergraduate and graduate) to submit academic work for widespread dissemination. The addition of a duo of open-access, scholarly resources to the existing research lab concept will increase access to the generated scholarship.

The first of these resources is Purdue e-Pubs, a subsidiary of Purdue University Press (PUP). E-Pubs is an open-access repository that allows scholars to archive their work in a database that is accessible through Google Scholar. A³IR-CORE administers the various Aviation Technology series; although submissions are not peer reviewed, it should be noted that publications are screened prior to submission, to ensure the works are of appropriate academic quality and reflect well on the department and aviation industry.

Secondly, the Journal of Aviation Technology and Engineering (JATE) is also operated and published by A³IR-CORE staff members. This biannual journal draws global submissions focused on issues that surround the aviation and engineering industries; a major function of JATE is to “promote the bridging” of these two areas in a collaborative environment. Through a double-blind, peer-reviewed process, the journal provides an academically rigorous forum for researchers, scholars, and practitioners to distribute their work to other researchers.

Collaborative Environments

One of the aspects most critical to the lab’s survival is the cohesive involvement of students from various scholastic levels combined with vital faculty mentoring. From the early stages of the lab’s development, it has been imperative to recruit diverse student participation among continuing scholars including doctoral candidates and master’s students. Then throughout its expansion, the lab began outreach to effervescent undergraduate researchers as an investment in future and long term goals while promoting continued schooling in higher education. These combined levels of education foster a conglomeration of ideas and experiences, which motivates and inspires cutting-edge research and development. This progression is then supervised by faculty advisors with distinct knowledge and experience within various facets of the aviation industry. Together they form a professional research group capable of tackling various problems and issues from industry.

Team members and faculty advisors bring new research topics and suggestions to weekly meetings, which facilitates collaboration and constructs innovative projects. Ultimately, it is this participation that builds the foundation for the future of the lab by producing published research papers and articles. Multiple studies have shown that this diverse enterprise among students and faculty encourages progress and achievement. Dotterer (2002) asserts, “Any campus that motivates its students to learn through individual and collaborative research—and can find ways to support these intellectual journeys with the necessary human and material resources—certainly does provide its students with a first-rate education” (p. 82). This ideology is crucially implemented in the foundation of A³IR-CORE and supports current and future progress among all members and advisors.

Under the supportive mentoring and guidance of faculty advisors, team members flourish in research opportunities and continuously cultivate advanced strategies. Additionally, a multitude of

available technical resources also facilitate research within the lab. The lab consists of several computers with statistical analysis capabilities as well as various reference books to ensure accurate and efficient production. Faculty advisors uphold further resources in the industry for additional assistance and reference. Furthermore, the combination of the lab’s resources, references and knowledge cultivates a dynamic research environment inspiring active participation and original conceptions.

Organizational Structure

Since the lab’s inception in May 2012, a vertical organizational structure has emerged as the preferred hierarchy; as time progressed, additional levels and layers of staff have been added to create a dynamic group with diverse skillsets and expertise. The Team Members make up the core of the research group, assisted by Team Volunteers. Both of these groups report to the Team Leader. Directly above the Team Leader is a horizontal level consisting of the Managing Director, Global Research Scholars, and Faculty Advisory Board. The aforementioned groups have direct access to the Director for collaboration and research support. A visual depiction of the organizational structure appears on the next page (Figure 1). Solid lines depict the research lab’s chain of authority; broken lines, on the other hand, are indicative of a collaboration relationship that has access to various parties for research ideas, support, etc.

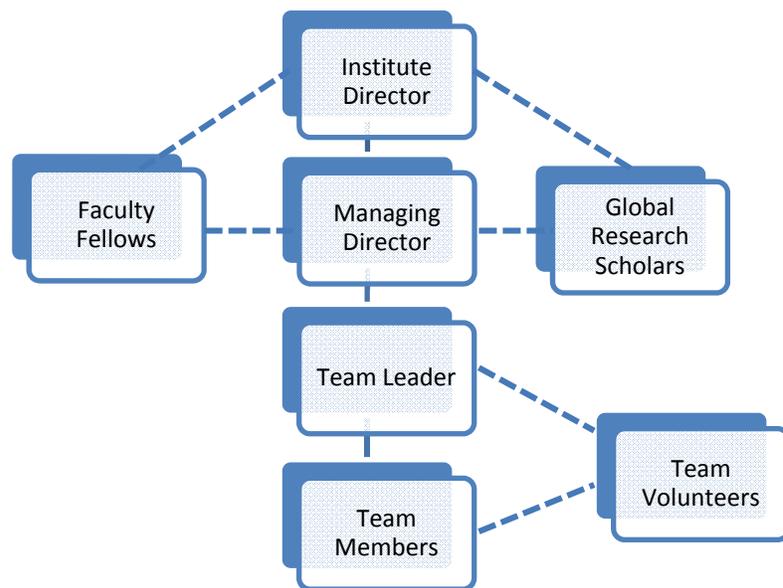


Figure 1. A³IR-CORE Organizational Chart

Director—the head of the research group, the director sets the pace and priorities of the lab. Allocation of funds, approval of research activities, and final decision-making and delegation authority rests at this level. Collaborating and building relationships with external faculty members and scholars is an important role that ensures a well-rounded membership.

Faculty Fellows—internal faculty members make up the core research support function of the group; providing research ideas and expertise in their respective areas, this board acts as a catalyst to start research in new areas otherwise left unexplored. Active participation from these members is cyclical, and often corresponds to the projects at hand.

Global Research Scholars—working collaboratively with academics and industry leaders from other universities and various entities abroad, global research scholars enrich and diversify the experience

and expertise of the research lab. Building bridges across the country and around the world is paramount in creating and maintaining relationships that foster greater learning potential, and increased exposure to emerging research ideas.

Managing Director—working closely with the team leader, faculty advisory board, global research fellows, and director, the managing director retains responsibility for all lab functions. This position acts as a mentor to all lab members, while spearheading projects and giving final approval before publications move from the research lab to the next step in the publication process. Maintaining a healthy and active relationship with internal and external contacts, the managing director represents the lab at various functions, both domestically and abroad.

Team Leader—the team leader serves to increase cohesiveness between group members, manage the lab’s continuous operations, and act as an efficient liaison between the research group and upper management (managing director and director). Scheduling staff, preparing for and leading working sessions/meetings, and acting as the general research group “organizer”, the team leader has a continually evolving role within the group, and must be ready to adapt to the dynamic environment

Team Members—after serving one academic semester as a team volunteer, interested parties are eligible for promotion to the team member position; compensation for time may include course credit, funding, or hourly pay. Promotion from volunteer status includes an increase in responsibility, including time commitments, publication output, and general responsibility for completion of projects, both individual and in tandem with the larger research group.

Team Volunteers—team volunteers are entry-level researchers looking for an area of interest to explore; appointment occurs after an informal submission of a resume/CV followed by an internal review during a regular team working session. A standardized letter of agreement is endorsed by the applicant and managing director upon recommendation by the team leader and concurrence of the team members.

Table 1.
Current A3IR-CORE Lab Staff Roster

Director		
Brent D. Bowen, Ed.D.	Professor and Department Head, AT*	Purdue
Faculty Fellows		
Erin E. Bowen, Ph.D.	Assistant Professor, TLI**	Purdue
Thomas Carney, Ph.D.	Professor, AT	Purdue
Chien-tsung Lu, Ph.D.	Associate Professor, AT	Purdue
John Mott, M.S.	Assistant Department Head, AT	Purdue
Michael Suckow, MBA	Assistant Department Head, AT	Purdue
Stewart Schreckengast, Ph.D.	Associate Professor, AT	Purdue
Global Research Scholars		
Mary Fink, M.S.	Academic Consultant, AT	Purdue
Nanette Metz, Ph.D.	Adjunct Faculty	Embry-Riddle
Allen Hamilton, Ph.D, G.G.	Lecturer, AT	Purdue
Core Research Group		
Jennifer Kirschner, M.S.	Managing Director, A ³ IR-CORE Research Lab	Purdue
Clay Wildt, B.S.	Team Leader, A ³ IR-CORE Research Lab	Purdue

Reilly Meehan, Student	Team Member, A ³ IR-CORE Research Lab	Purdue
Branden Avery, B.S.	Team Member, A ³ IR-CORE Research Lab	Purdue
Anthony Erstad, B.S.	Team Volunteer, A ³ IR-CORE Research Lab	Purdue

Note. *Aviation Technology, **Technology Leadership & Innovation

Current Research

Utilizing the multitude of expertise and resources available to our newly conceptualized research lab, various departmental projects will be routed through the lab for management and eventual completion. Using the collective knowledge of qualitative and quantitative methodology developed through intense and focused training, members of the research group will be prepared to tackle projects in the areas of public policy, airline quality measurement, passenger perceptions of airline quality, economic indicators of airline performance, management style, as well as a host of other airline-related topics.

Additionally, the lab currently partners with Purdue University Libraries to host an open-access repository accessible to faculty and staff within the Department of Aviation Technology; through this service, scholars at all academic levels will be able to archive their work, regardless of the format. For instance, a student would be able to submit a poster presented at conference proceedings, PowerPoint slides used during a presentation, or white papers before they are submitted to other venues. By using analytic software built into the repository system (e-Pubs), authors can track the download count and geographic location of interested parties. Advocating for and administering the e-Pubs process within our own department, we hope to increase scholarship and publication by facilitating a seamless avenue to sharing work via the repository.

Departing from the traditional quantitative-centric view of research, the research group has worked hard to properly train and equip members of the lab to embrace other methodological techniques including qualitative data analysis. Using software such as NVivo 10, scholars have the opportunity to approach research from alternative angles using nontraditional data such as interviews, photographs, videos, essay-type survey responses, etc., to fully quantify previously unquantifiable data. In the aviation industry, the ability to adapt and use new techniques to investigate problems will produce innovative solutions.

Future Impacts

The ever increasing pace of globalization means that our economy is inextricably linked to the world. As more countries increased their rate of development and gain access to the middle class, the demand for air travel has skyrocketed in Asia, Africa, and Latin America. The growing pains associated with any rapid industrial expansion necessitates a strong focus on quality assurance and standards in order to ensure that the highest levels of safety are maintained. Airlines, and more broadly, aviation policymakers, require access to academic sources of information about best practices; this new demand for information access will need to be facilitated properly in order to ensure that information distribution is as streamlined as possible. This opens the door for researchers with expertise and global reach to link up with other researchers and industry partners around the world.

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*E. E. Block is now E. E. Bowen and has published scholarly articles in the aviation and psychology literature under both names.