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Rethinking Credentials for Aviation Sustainability: A DACUM Approach

Leila Halawi
Embry-Riddle Aeronautical University, halawil@erau.edu

RETHINKING CREDENTIALS FOR AVIATION SUSTAINABILITY: A DACUM APPROACH

Leila Halawi, Embry Riddle Aeronautical University

ABSTRACT

The pandemic of Covid-19 Millennials aren't the youngest working generation anymore, and Gen Zers are the new kids on the block. This group of individuals, born between 1995 and 2019, already makes up 5% of the total U.S. labor force, roughly 9 million people. However, the skills gap is real and exists, one in which research shows that new college graduates either do not have all the skills employers want, or they are not doing an excellent job of demonstrating those skills in their resumes.

Sustainability programs consistently encounter challenges that threaten the future as a viable academic discipline. It is exceptionally critical that academicians recognize these challenges, their implications and thus devise particular approaches to address them. Therefore, this research aims to identify what constitutes aviation and aerospace sustainability job skills to align better, improve, and fortify course content to support undergraduate and graduate students' future employment. Furthermore, this research intends to reinforce a present research effort to bridge the skills gap between industry needs for sustainability in aviation and aerospace workforce and university curricula.

INTRODUCTION

Millennials aren't the youngest working generation anymore, and Gen Zers are the new kids on the block. This group of individuals, born between 1995 and 2019*, already makes up 5% of the total U.S. labor force, roughly 9 million people. In 2016, the global Artificial Intelligence (A.I.) market grew to $1.4 billion, and by 2025, the global A.I. market is expected to expand to almost $60 billion, according to TechJury. Automation is a clear and present danger to an ever-increasing number of jobs. A widely-cited study placed 47% of U.S. jobs in the "high-risk category, meaning that associated occupations are potentially automatable over some unspecified number of years, perhaps a decade or two." The skills gap is real. Research shows that new college graduates either don't have all the skills employers want or do not do an excellent job of demonstrating their resume skills.

While in the past, the United States depended significantly on employers to identify specific job skills, currently, employers are seeking job-ready applicants. There is some agreement between educators and industry leaders that we should determine particular core skills, which should be instilled in the curriculum (Binkley et al., 2012). Administrators within higher education need to ensure that their curricula are relevant and contain enough flexibility to accommodate different learners and different social and economic needs (Husbands & Pearce, 2012).

A leading-edge education system should offer students training to obtain skills for the jobs that we foresee and those we cannot predict. Educators need to train and prepare students to adapt quickly to varying technologies, forms of work organization, and jobs. It is often assumed that the advent of digital technologies requires a fundamental change to the curriculum and the teaching and learning approaches used in schools and higher education institutions, such as universities, to prepare not only this generation of "digital natives" or the "net generation," but also to accommodate older learners and those who may be contemplating career changes.

Sustainability and aviation/aerospace are massive areas. Air transportation is still one of the world's largest influential industries and global economic engines. Aviation is a primary direct and indirect employer. It accelerates world trade growth and offers tourism means, often operating under a business model of tight margins and needed profitability. Within the aerospace and airline industry, sustainability and its environmental impact have long been a talking point. However, sustainability programs consistently encounter challenges that threaten the future as a viable academic discipline. Thus, it is exceptionally critical that academicians recognize these challenges and their implications and devise particular approaches to address them.

Educators need to train and prepare students to adapt quickly to varying technologies, forms of work organization, and jobs. It is expected that this effort will provide the groundwork for developing proposals to submit to organizations that support this type of work, such as the NSF initiative on environmental sustainability and the Higher Education Sustainability Initiative (HESI).

Many universities designed sustainability programs at both the undergraduate and graduate levels. For example, at Embry Riddle Aeronautical University, College of Aeronautics (COA), Department of Graduate Studies, sustainability in Aviation and Aerospace graduate program was introduced in 2018. To support this program, the Industry Advisory Board (IAB) often provides a broad and strategic view of the workforce's needs. However, feedback always lacks the specifics of any given job description and job analysis. A proposal of this nature seeks to expand upon the knowledge of those specific via a DACUM event.

The purpose of this research is to reinforce a present research effort directed at bridging the skills gap between industry needs for sustainability in the aviation workforce and university curricula.

DACUM PROCESS

The DACUM process is a structured brainstorming technique for job skill identification and comparison. The process consists of a panel of five to nine expert workers in the occupation/industry under examination, a competent and trained DACUM facilitator, and a recorder. During this process, panel experts create and verify professional job skills and proficiencies that employees should possess depending on the job skill category. For the DACUM to succeed, panel members are expected to be eloquent, outstanding workers in their occupation with highly-developed technical knowledge and skills. A facilitator should be particularly trained in the DACUM process for good and practical outcomes. The facilitator should draw upon particular task statements, deal with the conflict between experts, and moderate the debate to reach a consensus of job skill identification. The findings are then compiled and presented in a survey

format to a larger group of experts to validate job descriptions. Job description and eventually curriculum are then developed keeping required skills in mind to ensure assessment and activities align to industry required skills. The entire process's fundamental goal is to produce an industry-ready workforce by creating an industry-relevant curriculum and encouraging the flow of information between industry and academia.

DACUM Framework

This research aims to identify what constitutes aviation/aerospace sustainability job skills to align, improve, and fortify course content to support graduate students' future employment. This research project will rely upon a DACUM framework as its method and Design as the process for using a DACUM, and the process for conducting a DACUM is the same.

Therefore, a DACUM event will be conducted; the location and date will be determined during initial planning. The DACUM process is brainstorming, yet structured technique, for job skill identification and comparison (Dacum.org, 2001). The process consists of a panel of six to nine expert workers in the occupation/industry under examination, a competent and trained DACUM facilitator, and a recorder (Eastern Kentucky University, (n.d.). During this process, panel experts create and verify professional job skills and proficiencies that employees should possess depending on the job skill category. For the DACUM to succeed, panel members are expected to be eloquent, outstanding workers in their occupation with highly-developed technical knowledge and skills. A facilitator should be exceptionally trained in the DACUM process for good and practical outcomes. The facilitator should draw upon particular task statements, deal with the conflict between experts, and moderate the debate to reach a consensus of job skill identification (Eastern Kentucky University, (n.d.). The findings are then compiled and presented in a survey format to a larger group of experts to validate job descriptions. The curriculum is then developed keeping required skills in mind to ensure assessment and activities align to industry-required skills.

To prepare to host a DACUM event, experts will be sought from organizations with an established sustainability and sustainability consultants and subject matter expertise (SMEs) through snowball sampling. Our research subjects will be selected from a pool of professionals with significant experience in the field, whether identified through conference attendance, academic memberships, or current literature concerning the airlines and aerospace sustainability research projects. Additionally, for diversity, the author plan to secure experts from independent, nonprofit, and globally identified associations that engage in the development, adoption, and use of globally accepted, industry-leading knowledge and practices for the topic of sustainability as an entire curriculum.

For a DACUM to succeed, this project requires two expert groupings: (a) the expert DACUM panel and (b) the extended expert survey group, who are expected to validate the DACUM workshop findings. The author is a certified DACUM facilitator that will support the event's overall facilitation. The author will hire a recorder for the session and will help identify the experts' pool based upon her previous work as the principal program developer of the Sustainability Program at COA. For initial expert pool identification, the author plan to conduct Zoom interviews with Consultants, Managers, and senior personnel from various companies

during any of the following conferences: Sustainability Summit 2021, the Sustainability Consortium Summit (TSC 2020); or the Association for the Advancement of Sustainability in Higher Education (ASHE), 2021 Climate Leadership Conference.

The author plan to recruit survey participants from the university's existing pool of faculty to collect data about their perceptions of our existing programs' effectiveness. Initial expert interviews will be conducted during said conference time allows or interviewee availability where possible; thus, this method supports a more personable, comfortable, and effective communication method to best support the overall initial DACUM process. During the initial interview, participants will often provide only surface-level information, which helps ask yes or no questions concerning who they believe is an expert in the field. The author will interpret what each participant shared and then share the transcript with additional field experts in the form of a survey for validation of DACUM findings

The researcher plan to create initial survey instrumentation to support the interview process to identify the overall expert pool.Within the DACUM workshop, the researcher will follow the normal DACUM workshop process of brainstorming, categorization, and summarization of job skills per job category and document findings by creating Job Descriptions for each of the positions identified by the panel during the event. No additional instruments, other than supplies, and ranking tools, such as note-taking tools or software, will be required. A printed packet containing the DACUM Process will be supplied to all the workshop attendees.

The purpose of this two-part project aims to conduct a DACUM event that involves expert identification and a DACUM workshop. A DACUM is a well-organized workshop held to analyze job skill tasks associated with a given employment position or job description (Reid, 2003). The event operates under the advisement of a skilled DACUM facilitator with the assumptions that the selected panel members:

（1) can better describe their job than anyone else, (2) any job can be effectively described in terms of the competencies or tasks that successful workers in that occupation perform, and (3) the specific knowledge, skills, attitudes, and tools required by workers to perform their tasks correctly can also be described (Reid, 2003, p. 1)

Part one of this research seeks to identify an expert pool and narrow down this pool to a six to the nine-member panel, a unique sample size as indicated within the literature (Reid, 2003). Other identified experts will be used to validate DACUM workshop results. The overall DACUM process's objectives are to identify job skill need versus curriculum assessment and activity inclusion. Therefore, part two of this project seeks to document the initial DACUM workshop results and survey the vast expert pool to validate DACUM findings and convert findings into usable results within the curriculum development process. Findings will then be analyzed to generate supportive curricular assessment and activity alignment to support future course development that best supports graduation employment opportunities.

CONCLUSION

While many researchers and associations have examined sustainability's deepest foundations, it is still imperative to investigate its methods philosophically to recognize better the key issues confronting sustainability, appreciate the field, and recognize the discipline. The outcomes of this research will provide new resources to advance the body of knowledge on aviation and aerospace sustainability practices. The findings may be used to improve the existing frameworks and policies.

The proposed research will enhance the understanding of sustainability as a discipline by investigating existing models and frameworks and the different perspectives on sustainability to propose a solid curriculum. The goal of this research is to leave no stone unturned and to move sustainability from where it is today, in the pre-paradigm phase, to the realms of normal science where sustainability can be deployed to help organizations not limited to the aviation and aerospace fields accomplish goals such as increase profits, reduce risk, remain agile, and address common threats within their industry.

Identifying what attracts learners into a particular program is a question companies and administrators have been trying to answer for years. With the increased pressure of state and federal accountability systems, an effective, viable, and aligned curriculum is critical to student success. This research proposed has the potential to expand the knowledge of data about employment skill identification and curriculum alignment and provide insight on how these data can be used to signal weaknesses or flaws in the current written curriculum instead of being used solely to identify gaps in student learning, which may be of further investigation.

This research will conclude with recommendations for mitigating the gap between enrollment and employment through curriculum development, which may lead to external funding considering the state of STEM-related programs. Curricula recommendations play an important role in developing academic and professional fields and should reflect consensual views of educational programs to best contribute to their identity and employment variability. Furthermore, the discussion of outcomes from this study will benefit curriculum designers, program managers, program evaluators, and accreditors alike, all of which have a stake in this field's broader impact.

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