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Toward an understanding of computing faculty internationalization perceptions

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Abstract

This paper summarizes the results of a faculty internationalization perception survey completed by 74 computing faculty. Building on the results of an earlier part of the project (Phase 1), this phase sought to determine whether the hypotheses generated in during data exploration phase would be replicated. For each hypothesis generated in Phase 1 an ANOVA was conducted that determined no statistically significant difference existed at 0.5 alpha level. The lack of a statistically significant difference was not anticipated. Nevertheless, this is an important finding as it is counter to what was discovered in initial research. The concluding section offers some explanation for the unanticipated findings.

Keywords: Computing, Internationalization, Faculty, Perception, COVID-19

Introduction

This project builds on the Faculty Internationalization Perceptions Survey (FIPS) work pioneered by Dr. John Criswell while at the University of Missouri-Columbia (Criswell, 2014). Criswell concluded his instrument design and theoretical model by validating it using Confirmatory Factor Analysis. His initial set of 20 questions was eventually reduced to 10, loading across four constructs: institutional support, financial support, faculty expectations, and faculty rewards. Initial testing by Criswell (2014) verified the usefulness of the instrument by identifying differences within and between institutions examined. Specifically, the effect of institutional support was found to be significant: $F(2,283) = 4.777, p = .009$ with post hoc analyses using Tukey's test identifying the source of the difference. Using an analysis of variance, financial support similarly showed the effect of an institution's financial support to be significant: $F(2,283) = 5.360, p = .005$. Again, a post hoc analysis using Tukey revealed the source of the difference identified. Further analysis of variance affirmed that the other two facts—faculty expectations and rewards—“showed that there were no significant differences between them” (Criswell, 2014, p. 102).

Our investigation prioritizes the constructs of institutional support and financial support identified by Criswell (2014) In early 2020 we launched a project (our Phase 1) centered upon the following research question: Do significant differences exist amongst computing faculty members' perceptions of support for internationalization? Specifically, we were interested in exploring whether demographic characteristics or professional experiences might account for any differences. Such differences were highlighted by Criswell (2014) in his original research.

Given the investigative nature of our Phase 1 research we opted to adopt a data exploration methodology, which has been described as “the art of looking at your data, rapidly generating hypotheses, quickly testing them, then repeating again and again and again. The goal of data exploration is to generate many promising leads that you can later explore in more depth” (Grolemund & Wickham, 2017). A data exploration methodology differs from the more traditional inferential approach in that the same data is visualized and tested repeatedly. The ability to visualize the data in a variety of forms is a major advantage of this methodology, or as John Turkey suggested, “The greatest value of a picture is when it forces us to notice what we never expected to see” (1977, p. iv).

The primary goal of our Phase 1 research was hypothesis generation that we anticipated would be used in future research focusing on computing faculty. We include in this population faculty who teach in information technology, information systems, computer science, or other related domains. This grouping is similar to the way in which the Joint Task Force for Computing Curricula 2005, a cooperative project of The Association for Computing Machinery (ACM), the Association for Information Systems (AIS), and the Computer Society (IEEE-CS), viewed the field. In their Overview Report, the authors noted “Computing consists of several fields, and many respected colleges and universities offer undergraduate degree programs in several of them such as computer science, computer engineering, information systems, information technology, software engineering, and more” (Joint Task Force on Computing Curricula, 2005).

After receiving Institutional Review Board approval for our Phase 1 project, we hosted our instrument online using Google Forms. Key to this project were three statements related to faculty perceptions of institutional support (InstSp) and three questions about financial support (FinSp). Respondents were asked to indicate to what extent they agreed with the following statement concerning the campus where they were currently working:

InstSp1: Top leaders express verbal and written support for internationalization.

InstSp2: Institutional mission/vision statements specifically reference an international dimension (e.g. global, international, world, multinational).

InstSp3: Top leaders express support for faculty participation in international activities.

FinSp1: Adequate funding for international teaching is available.

FinSp2: Adequate funding for international research is available.

FinSp3: Adequate funding for international conferences is available.

The major findings from our Phase 1 research were (Girard, Thomason, & Tsavatewa, 2020):

- There was a significant difference in mean Institutional Support [$F(1,67) = 4.355, p = 0.0407$] between reported International Teaching categories. Post hoc analysis (Tukey HSD) indicated there was a significant difference between Yes and No ($p = 0.040706$).
- There was a significant difference in mean Financial Support [$F(1,67) = 7.084, p = 0.00973$] between reported Language categories. Post hoc analysis (Tukey HSD) indicated there was a significant difference between Yes and No ($p = 0.0097265$).
- There was a not significant difference in mean Financial Support [$F(2,67) = 2.61, p = 0.081$] between Gender categories at the 0.05 alpha level. There was a significant difference at the 0.10 so it may be worth considering this hypothesis when evaluating a larger sample.

Research methodology

In late 2020, we relaunched our survey instrument with a view to collecting Phase 2 data to test the hypotheses we generated in our Phase 1. Our data collection replicated our Phase 1 plan using a convenience sample by soliciting respondents through conference contacts, listservs, and LinkedIn groups. Once the data was collected, we applied a traditional approach to testing our data for statistically significant difference at 0.5 alpha level using ANOVA and Post hoc analysis (Tukey HSD) when appropriate.

The hypotheses developed based on our Phase 1 findings are:

H₁: Faculty who have international teaching experience and faculty who do not have international teaching experience have different perceptions of institutional support.

H₂: Unilingual faculty and multilingual faculty have different perceptions of financial support.

H₃: Faculty of different genders have different perceptions of financial support.

Results

Descriptive Statistics

A total of 74 usable responses were collected during Phase 2. The country of residence of the sample population is shown in Table 1, the demographic characteristics are shown in Table 2 and the professional experiences are shown in Table 3.

Table 1. Country of Residence

Country	Count	Percent
United States of America	36	49%
Australia	6	8%
Canada	4	5%
Nigeria	3	4%
Germany	2	3%
Philippines	2	3%
Unreported	2	3%
Austria	1	1%
Bosnia and Herzegovina	1	1%
France	1	1%
Haiti	1	1%
Hungary	1	1%
India	1	1%
Indonesia	1	1%
Iran	1	1%
Israel	1	1%
Jordan	1	1%
Korea, South	1	1%
Kuwait	1	1%
Libya	1	1%
Malaysia	1	1%
Poland	1	1%
Portugal	1	1%
Russia	1	1%
Sweden	1	1%
Togo	1	1%

Table 2. Demographic Characteristics

Characteristic	Count	Percent
<i>Gender</i>		
Female	26	35%
Male	47	64%
Prefer not to answer	1	1%
<i>Faculty Status (FacStatus)</i>		
Fulltime Non-tenure Track	11	15%
Fulltime Tenure Track	12	16%
Fulltime Tenured	36	49%
Part-time	9	12%
Other	6	8%
<i>Speak Second Language (Lang)</i>		
No	23	31%
Yes	51	69%
<i>Lived Outside Country (LiveOut)</i>		
Yes	44	59%
No	30	41%

Table 3. Professional Experiences

Experiences	Count	Percent
<i>Student Exchange (StuExch)</i>		
No	53	72%
Yes	21	28%
<i>Faculty Exchange (FacExch)</i>		
No	57	77%
Yes	17	23%
<i>International Research (IntRes)</i>		
No	29	39%
Yes	45	61%
<i>International Teaching (IntTea)</i>		
No	30	41%
Yes	44	59%

Hypotheses Testing

For each of the three hypotheses the same testing was conducted. In each case an ANOVA was conducted to determine whether a statistically significant difference existed at 0.5 alpha level. A statistically significant difference would confirm the hypotheses generated during Phase 1. The ANOVA results for each hypothesis were:

- There was a not significant difference in mean Institutional Support [$F(1,72) = 1.701, p = 0.196$] between reported International Teaching categories.

- There was a not significant difference in mean Financial Support [$F(1,72) = 0.595, p = 0.443$] between reported Language categories.
- There was a not significant difference in mean Financial Support [$F(2,71) = 0.91, p = 0.407$] between Gender categories

The lack of a statistically significant difference existing at 0.5 alpha level was not anticipated. Nevertheless, this is an important finding as it is counter to what was discovered in Phase 1. To better understand the finding, see the following section.

Discussion of findings

Because international education work requires significant preparation, a major disruption such as that created by the COVID-19 pandemic has consequences that can persist for months and even years. Strategic planning and goal-setting remain difficult to accomplish and institutional priorities are likely to lie elsewhere. Institutions have shifted focus from the long-term planning and sustainable program development typical of international education and turned attention to crisis management. Similarly, individuals have found their professional and personal lives radically rearranged by the pandemic: childcare unavailable, travel funding eliminated, teaching assignments suddenly converted from in-person to virtual, conferences canceled or moved online, and much more. As the story of COVID is still being written, it is too early to draw conclusions about the pandemic's ultimate effect on international education. The approach is now changing from one of acute crisis management to one of longer-term adaptation, with some tentative movements toward resuming forward planning. But much is still uncertain.

When the impact of COVID began to be felt in the United States in March 2020, institutions necessarily emphasized bringing home their own students and faculty from overseas and assisting foreign students who needed or wanted to return to their home countries. Planned programs for spring 2020, and then summer 2020, and then fall 2020, were scuttled or converted to virtual. The actions of a few major national programs and organizations are representative of the many institution-level decisions taken in the wake of the pandemic: the Fulbright Program suspended its activities in March 2020, then announced in October 2020 that it "is tailoring its plans on a country-by-country basis to resume in-person exchanges for U.S. participants after January 1, 2021." (Bureau of Educational and Cultural Affairs, 2020) It seems probable as of this writing that the resumption of exchanges will be delayed further. The Benjamin Gilman scholarship program, which funds student travel for study abroad, similarly ceased to support student travel from March through December 2020. It began funding virtual abroad programs starting with its October 2020 application cycle. The Gilman program has announced that as of January 1, 2021 it will once again fund travel to destinations with State Department travel advisories level 1 or 2. However, such destinations are few and far between as most of the globe remains under level 3 advisory due to COVID (U.S. Department of State Bureau of Educational and Cultural Affairs, 2020). The Centers for Disease Control and Prevention continues to recommend that universities "consider postponing or canceling upcoming student international travel programs." (Centers for Disease Control and Prevention, 2021) Meanwhile, many inbound exchanges are likely to be affected by the presidential travel bans that prohibit entry to the U.S. by most travelers from Brazil, China, Iran, the European Schengen area, Ireland, and the United Kingdom, including those on J exchange visitor visas. CDC's new requirement of a negative COVID test to enter the United States could further complicate international programming plans (Centers for Disease Control and Prevention, 2021).

In internationalization as in every other field, the story of COVID-19 is still being written. Drawing conclusions would be premature, but no one is untouched. The Forum on Education Abroad, one of the most respected sources of research and professional development on internationalization, issued a "2020

State of the Field” report based on survey responses from 211 institutions collected in fall 2020 (The Forum on Education Abroad, 2020). 100% of respondents reported that COVID had “impacted their education abroad programs, students, and/or services.” 40% reported reductions in staff and 80% reported budget cuts. Of course, international offices are not alone in absorbing negative financial consequences due to the pandemic. Colleges and universities as a whole are struggling with loss of revenue. International education—perceived as an expensive, high risk, and ultimately optional undertaking—merely presents a ready target for cuts.

All of these uncertainties and difficulties seem likely to exacerbate existing communication problems that hold back the growth of international education. Prior research on faculty perceptions of internationalization demonstrates a gap between institution-level priorities and faculty- or department-level accomplishment. Michael Stohl noted in 2007 that at Purdue University where he had served as Dean of International Programs, “it is not clear that even after almost 15 years of task forces, grant programs and spirited endorsement by senior university administrators that most faculty members had internalized the ‘cause’ of internationalization” (Stohl, 2007, p. 362). The second and related gap is a lack of communication between institutions’ study abroad or international offices and their faculty. Giedt et al. find that “many study abroad offices have been somewhat removed from the institution’s faculty or its academic core, and thereby not truly integrated into academic departments” (2015, p. 174). The same studies demonstrate the central role of faculty in building study abroad participation, suggesting that internationalization is much more difficult when communication is fragmented.

In the Forum “State of the Field” survey, over 40% of respondents answered “Not sure” to the question of when their institution might “return to normal.” (The Forum on Education Abroad, 2020). Though it’s too soon to say for sure, the differences in faculty perceptions reported in our study may have flattened precisely because so much is uncertain. The overall response represents a “Who knows?” unaffected by international background, professional background, or travel experience. Institutions on a crisis footing due to COVID are not focused on longer-term priorities such as internationalization. Institutional risk aversion may dissuade faculty from asking for support for international activity.

And faculty may be questioning whether this is a good time to get involved in internationalization, especially for the first time. Existing international programs, providers, and conferences have pivoted to virtual offerings, but expertise in virtual programming is not widely distributed and uptake may be limited. Not many newcomers to the field would choose a virtual experience as their first exposure to internationalization whether as a student, researcher, or faculty leader. Moreover, faculty are in crisis mode dealing with unfamiliar teaching modalities, students’ health, their own health, and family caregiving, and may have little appetite for new projects.

Conclusion

This paper summarized the results of a faculty internationalization perception survey completed by 74 computing faculty. The primary objective of this project was to test hypotheses generated from prior exploratory research. The research team anticipated a statistically significant difference, which did not appear. We postulate that general uncertainty related to the COVID-19 pandemic and response may have contributed to participants’ responses. Future efforts of this research stream will examine the impact of the pandemic event within the available data sets and expand sampling to examine faculty perceptions broadly and across disciplines. This research contributes to the expanding field of perception research in international education by further disseminating and evaluating an emerging instrument.

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