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Abstract. The purpose of this article is to examine research and teaching trends over the past 30 years in U.S. higher education. While some faculty lean toward teaching and others toward research, often the two areas of intersect in synergistic and complementary ways. The merit of this study is that it is a follow-up of two earlier surveys. Findings include an examination of national data from 1992, 2007, and 2018 on a few select areas of the teaching-research nexus. The 2018 data includes 1,135 faculty responses from 80 higher education institutions in the United States. The once dominant research output gap between U.S. faculty and those in other countries is leveling off in many subject areas, most notably in STEM subject areas. Findings provide an in-depth analysis by faculty rank, highlighting current research and teaching preferences of junior and senior faculty members. The article also provides a model to partially explain faculty productivity among sampled participants where research preference, collaboration, and institutional research expectations serve as key predictors. Several suggestions for future areas of research are given in the conclusion section.

Keywords: teaching-research nexus, higher education trends, United States, research trends, teaching trends

Introduction

Faculty productivity in relation to teaching, research, and community engagement in the United States has a long history of scholarship (Bowen & Schuster, 1986; Clark & Lewis, 1985; Jacob, Sutin,

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Weidman, & Yeager, 2015; Cummings & Finkelstein, 2012). It is an area of professional development emphasis, especially as it relates to student learning and engagement (Galbraith & Merrill, 2012), competency-based learning (Jacob & Gokbel, 2018), and shifts and trends in the higher education landscape (Blakesley, Jacob, & Menke, 2019).

Faculty status is important when it comes to institutional type (private, public, or semi-public) as this often impacts the emphasis placed on research, teaching, service, and outreach initiatives. With the majority of U.S. faculty in non-tenure-stream positions, the trend toward increased faculty productivity is more often linked to increased teaching assignments, administration responsibilities, and student learning rather than increased research outputs and impact (Cohen & Kisker, 2010).

As of December 2018, the U.S. continues to lead all countries in total number of academic journal publications with 683,003 documents (see Table 1), but the U.S. national research output lead varies depending on academic discipline (SCImago, 2018).

Table 1. Research productivity by country, 1997, 2007 and 2018

Country	1997 Publications				2007 Publications				2018 Publications			
	Total	Bus., Mgt. & Acct.	Engr.	Educ.	Total	Bus., Mgt. & Acct.	Engr.	Educ.	Total	Bus., Mgt. & Acct.	Engr.	Educ.
Brazil	11,273	8	308	32	37,257	96	456	407	81,742	377	1,162	1,981
Canada	43,400	142	1,137	575	79,014	348	1,396	1,128	111,561	610	1,748	2,399
Chile	1,997	4	31	14	5,379	19	54	60	14,618	54	277	490
China	36,191	27	1,951	21	225,040	159	11,522	471	599,386	1,177	27,427	2,960
Germany	84,528	213	1,728	179	132,254	643	3,271	650	180,608	1,063	3,316	2,006
India	22,457	138	402	34	53,091	399	684	91	171,356	831	10,437	1,127
Japan	97,032	69	3,584	123	124,677	127	3,564	293	131,198	240	3,941	749
Mexico	5,500	4	120	104	13,150	17	262	229	25,290	86	666	550
Russian Federation	32,833	21	1,106	10	36,164	9	843	50	99,099	734	7,700	2,112
So. Africa	4,867	19	70	86	9,452	75	106	180	25,150	295	518	1,054
Turkey	6,199	13	101	20	25,610	75	434	300	45,582	160	1,017	1,675
USA	**358,351**	**1,765**	**10,517**	**7,055**	**531,652**	**2,709**	**9,826**	**10,706**	**683,003**	**3,232**	**11,105**	**19,951**

Source: SCImago (1997, 2007, 2018).

The U.S. domination in the areas of Business, Management, and Accounting; Engineering; and Education in 1997 saw dramatic decreases over the past two decades. Where U.S. faculty members published over four times the Engineering documents than did their Chinese counterparts in 1997, the U.S. has ranked second to China in this area since 2007. The U.S. experienced a decrease in Engineering output with 9,826 documents (-6.6%) in 2007 compared to publishing 10,517 Engineering documents in 1997. This highlights the international trend where other countries such as China and India are placing higher emphasis on STEM-related areas compared to many U.S. students and scholars at secondary and post-secondary institutions (Desilver, 2017; Jacob & Gokbel, 2018; McDonald & Waite, 2019; Suter & Cimilli, 2019).

The faculty productivity output gap has decreased percentage wise between the U.S. and many other countries in the areas of Business, Management, and Accounting and Education. Yet, the U.S. still holds a significant national lead in total output in both of these social science areas with 83.1% and 182.8% output growth respectively from 1997 to 2018. U.S. faculty member's journal article publications output grew at a steady pace since 1997 (91%), but the percentage comparison was significantly lower than the growth realized in China (1,556%), India (663%), Turkey (635%), Brazil (625%), and Russia (202%) (Wu & Djurovic, 2018).

The mission of producing and advancing new ideas has been active in the American higher education system throughout the twentieth century, particularly among elite or well-developed institutions. However, the involvement in research productivity has seen a remarkable increase since the 1980s, as a new combination of factors facilitated its sharp development. Among others, for instance, a growing government budget reduction for public universities; escalating labor and technology costs; a Neoliberal policy context that allowed universities to profit with research; and, an internal need to increase revenues (Francis & Hampton, 1999; Slaughter & Leslie, 1997). The *Bayh-Dole Act* (1980) was a breakthrough policy that allowed non-profit organizations to retain intellectual property from federally funded initiatives (Powell & Owen-Smith, 1998). This, besides encouraging external funding, created a significant shift in the quadruple helix relationship between academe, industry, government, and the community (Powers, 2004; Jacob et al., 2015). Consequently, the commercialization of research was and is currently encouraged through patents and the profitable licensing of university/industry/government partnerships (Bozeman, Fay & Slade, 2013).

On the other side, as the economy became more knowledge-based, corporations and businesses were forced to develop new research to remain competitive against an increasingly globalized and complex market. According to Rosenbloom and Spencer (1996):

> Within the large corporations, there was growing recognition that firms had become much less self-sufficient in their ability to generate the science and technology necessary to fuel economic growth. 'What was once a race has become more like a rugby match.' They anticipate a 'diminishing role for corporate laboratories as the wellspring of innovation', and suggest that the 'seeds of new technological advance will probably sprout more often in university or government laboratories.' (As cited in Powell & Owen-Smith, 1998, p.173)

These political and corporate challenges facilitated by changes in the environment surrounding universities, prompted "a second revolution" in higher education, as outlined by Etzkowitz, Webster, and Healey (1998):

> The academic revolution of the late nineteenth and early twentieth centuries introduced a research mission into an institution hitherto devoted to the conservation and transmission of knowledge. Building upon the first revolution, the second academic revolution is the translation of research findings into intellectual property, a marketable commodity, and economic development. (p.21)

These factors produced deep shifts, redefining core mission values that pushed academia to rethink the "ivory tower" model of relationship with ideas. The university was forced to reengineer itself as more entrepreneurial, with the scope of transfer discoveries seeking for multiple types of impact (Duderstadt, 2000). Little by little, higher education was expected to boost economic development, as well as bridging access to new resources that would provide for better budgets, facilities, research, and more academic programs (Becker & Lewis, 1992; Bok, 2003; Bowie, 1994; Callan & Finney, 1997; Duderstadt, 2000; Lapidus, Syverson, & Welch, 1995; Slaughter & Leslie, 1997). This new university paradigm hinges on a larger network of interdependent relationships in which government and industry-business operate as partners with academe in a quadruple helix knowledge production approach (Etzkowitz, 1996; Carayannis & Campbell, 2018). However, it is important to underscore, much of the innovation is produced at top research universities, since generating knowledge is expensive and requires the right combination of environmental and human resources (Gregorutti, 2011). So, American higher education institutions are actively evolving into entrepreneurial approaches to survive and prosper within a constantly changing and challenging environment (Shin, Lee, & Kim, 2013).

The central idea is that the current society depends on innovation that stems from knowledge-based solutions; this notion is often referred to as the "knowledge-society" (Altbach, 2013; Kezar & Eckel, 2000; Meyer, 2003). Start-ups and spin-off inventions often translate into new employment opportunities further growing the broader economy and economic systems (Barrett, 2017). Faculty research productivity is central to address some of the business and the overall society needs. But in doing so, institutions go, at the same time, through tensions that collide with traditional approaches to faculty productivity and, particularly, service to students. Thus, faculty productivity often hinges on a delicate balancing act between the teaching-research-service nexus in higher education (Jacob et al., 2018). On the one hand, productive research output often requires increased time and funding inputs necessary to generate greater knowledge production outputs. Traditional income sources, such as tuition and government appropriation funds, for public institutions, are not enough. Faculty members are also increasingly asked to do more with less funding. Increased teaching and community engagement demands often leave faculty members with less time and resources to devote to productive research. Faculty members and higher education administrators often find it difficult to navigate an already disrupted higher education landscape that is increasingly student-focused and entrepreneurial (Bleiklie, 2005; Bleiklie & Powell, 2005; Christensen & Eyring, 2011; Jacob & Gokbel, 2018).

Less research-oriented HEIs often struggle in their attempts to balance teaching and research obligations (Gregorutti, 2011). Engaging in entrepreneurial research behaviors is often prevented by an expected full load of teaching with many classes and students to advise. Faculty members at these institutions often tend to publish fewer reports and generate less external funding for impactful research projects (Blackburn & Lawrence, 1995). The reward and tenure promotion system tends to

underline the importance of research for the betterment of faculty members and universities (Leslie, 2002). However, in spite of these restrictions, some departments and, particularly, faculty members manage to reach high levels of faculty research productivity regardless of their environment (Gregorutti, 2011).

Our study provides an examination of national data from 1992, 2007, and 2018 on select areas of the teaching-research nexus. We provide an in-depth analysis by faculty rank, highlighting current research and teaching preferences of junior and senior faculty members. The article also provides a model to partially explain faculty productivity among the 2018 sampled participants where research preference, collaboration, and institutional research expectations serve as key predictors. Several suggestions for future areas of research are given in the conclusion section.

Research design

The US Academic Profession in the Knowledge-Based Society (APIKS) Survey is a ten-year follow-up to the Changing Academic Profession (CAP) Survey of 20 countries in 2007-08, and a 26-year follow-up to the 1991-92 Carnegie Foundation for the Advancement of Teaching International Survey (Carnegie Survey) of the Academic Profession of 13 countries (see Finkelstein & Cummings, 2008; Teichler, Arimoto, & Cummings, 2013).

Our sample consisted of 80 higher education institutions in 33 states, two territories (Guam and U.S. Virgin Islands), and Washington, DC (see Table 2).

Table 2. Types of HEIs (University Carnegie Classification – Categories by type)

Category	Public	Private	Total
1. Special-Focus Four Year Institution	0	3	3
2. Baccalaureate Colleges	3	2	5
3. Master's Colleges & Universities	11	12	23
4. Doctoral/Professional Universities	7	6	13
5. Doctoral Universities/High Research Activity	12	4	16
6. Doctoral Universities/Very High Research Activity	14	6	20
Total	48	32	80

These were the same 80 HEIs sampled in the CAP study. Similarly, of the 5,751 participants sampled during the CAP Survey, 3,428 remained at their respective HEI during the 2017-2018 academic year and were retained in the APIKS sample. These faculty members generally held an associate professor or full professor rank in 2018.

In the case that a person was no longer at their institution due to retirement, death, or moving to another HEI, we randomly selected another person from her/his institution who was currently at the rank of associate or full professor to replace this participant. Recognizing that the above sampling

procedure did not capture faculty who have joined the academy since 2004, for each of the 80 HEIs in the sample we created lists of "new" faculty. These lists consisted of randomly selected faculty at the focal institutions at the rank of assistant professor or lecturer. They were either on tenure track or not (noting that tenure does not exist at some of the participating institutions). This over-sampling of assistant professors was conducted so that a sufficient number of new faculty would be available for analysis.

Of the 10,238 faculty members invited to participate in the study, 1,135 responded (11.09% response rate). Three hundred and eighteen participants responded who also participated in the CAP Survey. Data was collected from September to December 2018. Roughly half of all participants were female and there was also stratification of each professorial rank (see Table 3). Participants were contacted by email and data was collected via an online Qualtrics survey. The study was approved by the University of Memphis Institutional Review Board.

Table 3. Gender and rank of participants

	1992 Carnegie Survey		2007 CAP Survey		2018 APIKS Survey	
Gender	**N**	**%**	**N**	**%**	**N**	**%**
Female	4,929	25.5	475	41.9	574	50.6
Male	14,400	74.5	660	58.1	560	49.3
Other	0	0.0	0	0.0	1	0.1
Rank						
Full Professor			588	51.3	329	29.0
Associate Professor			260	22.7	297	26.8
Assistant Professor			178	15.5	450	39.7
Other			120	10.5	59	5.2

Findings

Tables 3 and 4 show trends over time since the original Carnegie Survey to the APIKS Survey. Most notably is the gender shift from predominantly male participants in 1992 (74.5%) and 2007 (58.1%) to greater gender parity with 50.6% female and 49.3% male in 2018. This is reflective of national trends in gender faculty appointments, and where in some cases there is actually gender reversal where in some disciplines and types of HEIs there are more female faculty than men (Finkelstein et al., 2016). While the shift in faculty preference towards teaching was higher in 2018 (16.8%) than it was in 1992 (12.7%), it falls notably short of the 22.0% reported in 2007. Also of note is the continued decline in affinity faculty members displayed toward their HEI.

While over half of participants responded that their institution was "very important" to them in 1992, only 25.0% and 20.9% felt the same in 2007 and 2018 respectively. This institutional affinity phenomenon seems to mirror the trend toward a decrease in tenure-track faculty appointments from

what existed in the United States in the early 1990s compared to the higher education landscape today (Ran & Xu, 2018; Sav, 2016). Adjunct, part-time, and temporary-status faculty members no longer retain the institutional commitment often linked to tenure-track faculty status.

Hours devoted toward teaching and research remained relatively stable in 2007 and 2018; but time spent on research remained significantly lower than what was reported by participants in 1992. There has also been a shift toward increased workload expectations in non-teaching and research areas. Some of these additional areas include increased mentoring workloads, institutional committee assignments, and administration duties (Jacob & Sutin, 2018). Sustained reductions in higher education financing have required HEIs to make these additional workload assignments, often at the expense of where faculty have to sacrifice in other areas. Most notably, the area that suffers the most is in faculty research (Jacob et al., 2018; Kimmel & Fairchild, 2017; Mitten & Ross, 2018; Smeltzer et al., 2016).

Table 4. Selected comparisons from the Carnegie, CAP, and APIKS surveys

	1992 Carnegie Survey		2007 CAP Survey		2018 APIKS Survey	
Preferences in research or teaching?	**N**	**%**	**N**	**%**	**N**	**%**
Primarily in teaching	2,455	12.7	252	22.0	190	16.8
In both, but leaning towards teaching	6,534	33.8	388	33.9	414	36.7
In both, but leaning towards research	8,041	41.6	394	34.4	408	36.2
Primarily in research	2,281	11.8	111	9.7	116	10.3
How important is…?	**Very Important (%)**	**Fairly Important (%)**	**Very Important (%)**	**Fairly Important (%)**	**Very Important (%)**	**Fairly Important (%)**
My academic discipline/field	72.0	23.8	69.8	22.8	60.4	29.7
My department (at this institution)	36.7	42.0	39.1	37.5	30.9	37.6
My institution	52.4	35.1	25.0	33.9	20.9	32.8
Time spent in a typical week on…	**Hours**		**Hours**		**Hours**	
Teaching	18.7		21.2		20.3	
Research	16.5		12.4		11.7	

Research emphases declined in all areas questioned among participants from the CAP and APIKS surveys with the exception of faculty indicating a greater practical focus and emphasis on their research for the betterment of society (see Table 5). Several factors may account for these shifts. Faculty members are increasingly expected to do more with less. Teaching, mentoring, and administrative loads have generally increased among many HEIs. Financial constraints have in many ways exacerbated these shifts, with administrators increasingly looking at ways to reduce costs. Decreasing enrollment trends among many traditional student groups further exacerbate the financial strains pressing many U.S. HEIs (Jacob & Gokbel, 2018). At the same time, faculty members are also often expected to maintain a significant focus on research output that is increasingly measured in the public domain through SEO facilitation and digital platforms like ResearchGate, Google Scholar, and others that measure research impact.

Table 5. Research emphasis comparisons, 2007-2018

How would you characterize the emphasis of your primary research?	2007 CAP Survey		2018 APIKS Survey	
	Very much (%)	Not at all (%)	Very much (%)	Not at all (%)
Basic/Theoretical	22.0	12.2	19.5	12.9
Applied/Practically-oriented	34.0	8.4	35.7	8.4
Commercially-oriented/Intended for technology transfer	5.2	59.2	3.2	66.1
Socially-oriented/Intended for the betterment of society	25.2	15.4	27.6	14.2
International in scope or orientation	19.8	26.2	18.3	28.8
Based in one discipline	13.5	23.2	10.7	24.5
Multidisciplinary	39.8	8.6	31.0	7.1

The shift toward greater student accountability and alignment of disciplines with applied workforce demands upon graduation, lends well with the general trend toward more practical-oriented scholarship and instruction. Some of the HEI market leaders that have gained prominence within the U.S. higher education landscape over the past decade include those that focus on competency-based learning and research (Jacob & Gokbel, 2018). Some surprising findings from the APIKS survey that contradict much of the available literature on U.S. higher education include a decrease in interdisciplinary research and in internationally-oriented research (Jacob, 2015; Mwangi et al., 2018; West, 2018).

A closer look at the 2018 APIKS sample highlights clear areas of variance between preferences in teaching and/or research (see Table 6). This was especially noted among when it comes to the Carnegie Classification of participants' HEIs. Faculty career trajectories in the six noted types of HEIs in our sample often reflect whether teaching, research, or both areas are emphasized in faculty evaluations and preferences (Shin, Arimoto, Cummings, & Teichler, 2014; Betsey, 2017; Hollman et al., 2018; Stupnisky, BrckaLorenz, Yuhas, & Guay, 2018).

Table 6 highlights significant variability between faculty groups, with 51.1% of Assistant Professors and 51.2% of Full Professors preferring teaching compared to 57.6% of Associate Professors ($X^2 = 27.42$ $p < .01$). Age was a factor when it came to preference, most older participants indicated a greater preference on teaching than on research. The only group where HEI type was significant was among Assistant Professors, where participants in private HEIs reported a much higher preference on teaching (58.3% compared to 47.3% from public HEIs; $X^2 = 14.18$ $p < .01$). Also of note was the variance in gender responses among Full Professors where the majority of females reported preference on teaching compared with their male counterparts ($X^2 = 13.17$ $p < .01$).

Table 6. Faculty preference on teaching or research, 2018

	Assistant Professor (%)			Associate Professor (%)			Full Professor (%)		
	N	Teaching	X^2	N	Teaching	X^2	N	Teaching	X^2
Aggregate Responses	448	51.1		297	57.6		328	51.2	
Gender									
Female	241	52.7	2.87	169	59.2	0.66	128	58.6	13.17*
Male	112	49.5		128	55.5		200	46.5	
Other	1	0.0		0	0.0		0	100.0	
Age									
20-29	7	28.6	63.25**	1	100.0	32.94*	0	0.0	20.93
30-39	223	43.0		39	43.6		1	0.0	
40-49	119	48.7		96	44.8		40	27.5	
50-59	59	66.1		79	64.6		96	57.3	
60 or older	32	93.8		78	73.1		183	53.0	
HEI Type									
Public	292	47.3	14.18*	174	55.2	2.13	199	48.2	2.61
Private	156	58.3		123	61.0		129	55.8	
Carnegie Class. – Categories by Type									
Special-Focus Four-Year	4	25.0	104.45**	2	50.0	112.05**	14	35.7	90.41**
Baccalaureate Colleges	13	76.9		18	88.9		11	90.9	
Master's Colleges & Univ	60	78.3		41	85.4		76	75.0	
Doctoral/Prof Universities	97	75.3		71	80.3		49	83.7	
Doctoral/High Research Act	138	45.7		79	57.0		71	40.8	
Doctoral/Very High Res Act	136	25.7		86	19.8		107	24.3	

*$p < .01$; **$p < .001$

Research productivity

Advancing knowledge is one of the essential functions for the American higher education system. Publications, in the form of book, book chapters, and articles, are an initial approach to measuring faculty research productivity (Blackburn & Lawrence, 1995; Gregorutti, 2011). The APIKS survey collected several variables that allow researchers to explore some of the characteristics of research production in the sample. Particularly, this section of the study focuses on what factors motivate professors to publish.

According to Bandura (1986), behavior is the result of self-perceptions that interacts with external sources of influence, as he asserts:

> Cognitive factors partly determine which environmental events will be observed, what meaning will be conferred on them, whether they leave any lasting effects, what valence and efficacy they will have, and how the information they convey will be organized for future use. Thought also provides the means for monitoring and regulating one's efforts to manage and shape the events of daily life. (p.454)

Cognitive processes are central to deciding what is important, in this case publications in the institutional context. Behavior is the result of interacting effects of what Blackburn and Lawrence (1995) called self- and social-knowledge that generate the motivational basis of actions, as follows:

> … motivations lead to behaviors, to activities in the domains of teaching, research, scholarship, and service. To the extent that they have options, faculty members will allocate interest, by self-knowledge concerning their competence and their chances of success, and by the social knowledge they trust with regard to what students, peers, and administrators value and reward. Presumably, then, that effort will lead to products. (p.106)

The environment in which each professor works are the conditions that may impact their ability to produce research. If academic departments or units do not provide faculty members with a necessary balance that includes moderate teaching loads, resources to conduct research studies, or available time devoted to conduct scholarly activities, research productivity will be reduced. Levels of engagement to produce publication would depend on how professors perceive and process their own abilities in a given context. Therefore, it is expected that motivated professors would engage in actions such as research collaboration with peers across other universities, grant-seeking activities, conference presentations, among others. In turn, these behaviors would translate in publications such as scholarly journal articles and books.

Based on these theoretical assumptions, we developed a set of variables from the APIKS survey. As already mentioned above, the variable to be measured in this model was called Research Output and included scholarly books authored or co-authored, scholarly books edited or co-edited, chapters published in academic books, and articles published in academic journals. This computed variable reported publications over the last three academic years. There were five predictors that were created computing different question items following the theoretical assumptions expressed above and in the context of the relationship between teaching and research among the sampled institutions.

The five variables were organized in two constructs: (1) teaching-research preferences and personal research involvement; and (2) institutional research expectations, teaching involvement, and interaction with students. The first construct was called Personal Motivators and the second, Environmental Factors. Table 7 shows the details and items used to create the variables under the two constructs.

Table 7. Details of predictor variables

Survey Items	Variables Predictors	Constructs
B2 recoded with the highest value for research D1 with yes for “1” and no for “0” values	1. Research preference 2. Research collaboration	Personal Motivators
D5 with Likert scale C2 computed to a total of “9” activities. C3 computed to a total of “6” activities.	3. Inst. research expectations 4. Teaching involvement 5. Interaction with students	Environmental Factors

The variables were entered into a linear regression model with SPSS software. The ANOVA for the whole model was significant at $p < .001$ and the R^2 predicted 16% of the variance. Table 8 shows that three out of five factors were significantly impacting faculty research publications. According the beta values, Research Preferences was the strongest predictor in the model and Research Collaboration was important as well. These two factors confirmed that personal beliefs about self and therefore actions (collaboration) contribute to scholarly publications. To a lesser degree, Institutional Research Expectations contributed to explain some of the variance. This predictor was under the Environmental Factors verifying the theoretical assumption that surrounding conditions also have an impact on publications.

Table 8. Variables predicting faculty research productivity

Model	Unstandardized Coefficients B	Unstandardized Coefficients Std. Error	Standardized Coefficients Beta	t	Sig.
(Constant)	-3.043	.962		-3.162	.002*
Faculty preferences primarily in teaching or research	1.615	.323	.159	4.993	.000**
Research Collaboration	1.319	.163	.272	8.111	.000**
Institutional Research Expectations	.158	.056	.091	2.830	.005*
Teaching Involvement	.051	.121	.058	.424	.672
Student Interactions	-.099	.173	-.078	-.572	.568

a. Dependent Variable: Research Output.

*$p < .01$; **$p < .001$

On the contrary, Teaching Involvement and Interaction with Students did not yield any significant contribution to explain scholarly productivity. Evidently, for the U.S. APIKS sample, teaching load and time spent with students does not seem to prevent American professors from publishing. A word of caution ought to be said regarding the total variance explained. It is evident that these results are partial and the model used here does not necessarily capture other important factors intervening in the predicting equation.

One of the limitations to enrich the model is that most of the questions in the survey do not inquire about self-perceptions that the regression model showed to be crucial to predict some levels of outputs. The theoretical approach seems to be partially validated suggesting that further studies can accommodate new predictors to test the assumptions.

Conclusion

Higher education faculty research and teaching trends over the past three decades in the United States has seen many areas of growth and shifts. Depending on a number of variables and preferences, some faculty lean toward teaching and others toward research. Findings include a follow-up study in 2018 compared with national data in 1992 and 2007 of faculty member preferences in the U.S. along select

areas of the teaching-research nexus. The article provides an in-depth analysis of current research and teaching preferences of junior and senior faculty members. The article also provides a model to partially explain faculty productivity among 2018 sampled participants where research preference, collaboration, and institutional research expectations serve as key predictors.

Significant differences exist between junior and senior professors' preferences on teaching and research in the 2018 sample. Gender was noted as significant among full professors, but not among assistant and associate professors. Preferences for teaching and research varied significantly depending on what type of institution faculty participants worked at.

The findings from this analysis suggest many possible directions for studying faculty research productivity. Using alternative theoretical assumptions, the existing collected data can yield different models with predicting ability. We note how more consideration can be given to environmental and institutional impact on faculty research productivity. The "Institutional Research Expectation" factor was significant in the regression model, but with a small beta or contribution. Further research using different existing questions may share more light on how institutional expectations and conditions promote/prevent research output, especially for small to medium universities that don't have the range of resources to fully support faculty members in their research.

Teaching load and time spent advising, two factors used in the research productivity model, were not significant. This needs additional research, since generally speaking studies favor the conclusion that increased teaching load tends to negatively impact publications. On the contrary, personal preferences and research collaboration with colleagues were the dominant motivators to advance publications among faculty participants. Some demographic factors may explain some of the variance and may be included in other constructs. Accordingly, these findings may challenge some of the theoretical assumptions for this paper and therefore further models are a prerequisite for explaining and predicting more variance regarding faculty research productivity.

The three surveys examined in this article draw largely from national quantitative data. Substantial depth could be added to these findings by follow-up qualitative studies on various areas of faculty preferences related to the research-teaching nexus in U.S. HEIs. Additionally, our study is limited to traditional four-year institutions, and does not take into account responses from community college faculty members. More could be done to examine this subsector of higher education in the U.S.

References

Altbach, P.G. (2013). Advancing the national and global knowledge economy: The role of research universities in developing countries. *Studies in Higher Education, 38*(3), 316–330.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory*. Englewood Cliffs, NJ: Prentice-Hall.

Barrett, B. (2017). *Globalization and change in higher education: The political economy of policy reform in Europe*. London: Palgrave Macmillan.

Bayh-Dole Act, 35 U.S.C. § 200-212 (1980).

Becker, W., & Lewis, D. (1992). *The economics of American higher education*. Norwell, MA: Kluwer.

Betsey, C.L. (2017). Faculty research productivity: Institutional and personal determinants of faculty publications. In C.L. Betsey (Ed.), *Historically black colleges and universities* (pp. 57-92). New York: Routledge.

Blackburn, R., & Lawrence, J. (1995). *Faculty at work: Motivation, expectation, and satisfaction*. Baltimore, MD: Johns Hopkins University Press.

Blakesley, C.C., Menke, D.J., & Jacob, W.J. (2019). Global higher education trends: Implications for policy and practice. In L. Suter, B. Denman, & E.M. Smith (Eds.), *SAGE Handbook of Comparative Studies in Education* (pp. 490-505). Thousand Oaks, CA: SAGE Publications.

Bleiklie, I. (2005). Organizing higher education in a knowledge society. *Higher Education, 49*(1-2), 31-59.

Bleiklie, I., & Powell, W. (2005). Universities and the production of knowledge-introduction. *Higher Education, 49*(1-2), 1-8.

Bok, D. (2003). *Universities in the marketplace: The commercialization of higher education*. Princeton, NJ: University Press.

Bowen, H.R., & Schuster, J.H. (1986). *American professors: A national resource imperiled*. Oxford, UK: Oxford University Press.

Bowie, N. (1994). *University-business partnerships: An assessment*. Lanham, MD: Rowman & Littlefield.

Bozeman, B., Fay, D., & Slade, C.P. (2013). Research collaboration in universities and academic entrepreneurship: The-state-of-the-art. *The Journal of Technology Transfer, 38*(1), 1–67.

Callan, P., & Finney, J. (1997). *Public and private financing of higher education: Shaping public policy for the future*. Phoenix, AR: Oryx Press.

Carayannis E.G., & Campbell D.F.J. (2019). Mode 1, Mode 2, and Mode 3: Triple Helix and Quadruple Helix. In E.G. Carayannis, & D.F.J. Campbell (Eds.), *Smart Quintuple Helix Innovation Systems: How Social Ecology and Environmental Protection are Driving Innovation, Sustainable Development and Economic Growth*. Dordrecht, Netherlands: Springer.

Christensen, C.M., & Eyring, H.J. (2011). *The innovative university: Changing the DNA of higher education from the inside out*. San Francisco, CA: Jossey-Bass.

Clark, S., & Lewis, D.R. (Eds.)(1985). *Faculty validity and institutional productivity: Critical perspectives for higher education*. New York: Teachers College Press.

Cohen, A.M., & Kisker, C.B. (2010). *The shaping of American higher education: Emergence and growth of the contemporary system*. 2nd ed. San Francisco: John Wiley & Sons, Inc.

Cummings, W.K., & Finkelstein, M.J. (2012). *Scholars in the changing American academy*. Dordrecht, Netherlands: Springer.

Desilver, D. (2017). US students' academic achievement still lags that of their peers in many other countries. Pew Research Center, 15.

Duderstadt, J. (2000). *A university for the 21st century*. Ann Arbor, MI: University of Michigan Press.

Etzkowitz, H., Webster, A., & Healey, P. (1998). *Capitalizing knowledge: New intersections of industry and academia*. Albany, NY: State University of New York Press.

Finkelstein, M.J., Conley, V.M., & Schuster, J.H. (2016). *The faculty factor: Reassessing the American academy in a turbulent era*. Baltimore, MD: Johns Hopkins University Press.

Finkelstein, M.J., & Cummings, W.K. (2008). The changing academic profession in the United States: 2007. In S. Yamamoto (Ed.), *The Changing Academic Profession in International Comparative and Quantitative Perspectives* (pp. 75-88). Hiroshima, Japan: Research Institute for Higher Education, Hiroshima University.

Francis, J., & Hampton, M. (1999). Resourceful responses: The adaptive research university and the drive to market. *The Journal of Higher Education*, *70*(6), 625-641.

Galbraith, C.S., & Merrill, G.B. (2012). Faculty research productivity and standardized student learning outcomes in a university teaching environment: A Bayesian analysis of relationships. *Studies in Higher Education*, *37*(4), 469-480.

Gregorutti, G. (2011). *Flowing the path from teaching to research university: Increasing knowledge productivity*. Newcastle upon Tyne, UK: Cambridge Scholars Publishing.

Hollman, A., Bice, M.R., Ball, J., Bickford, N., Shafer, A.B., & Bickford, S. (2018). A comparison of scholarly productivity among current professors who obtained terminal degrees. *American Journal of Distance Education*, *32*(4), 267-282.

Jacob, W.J. (2015). Interdisciplinary trends in higher education. *Palgrave Communications*, *1*(1), 1-5. DOI: 10.1057/palcomms.2015.1.

Jacob, W.J., & Gokbel, V. (2018). Global higher education learning outcomes and financial trends: Comparative and innovative approaches. *International Journal of Educational Development, 58*(1), 5-17. DOI: 10.1016/j.ijedudev.2017.03.001.

Jacob, W.J., & Sutin, S.E. (2018). Global trends in higher education financing. *International Journal of Educational Development, 58*(1), 1-4. DOI: 10.1016/j.ijedudev.2017.12.002.

Jacob, W.J., Sutin, S.E., Weidman, J.C., & Yeager, J.L. (Eds.)(2015). *Community engagement in higher education: Policy reforms and practice.* Boston, Taipei, London, Rotterdam: Sense Publishers.

Jacob, W.J., Xiong, W., Ye, H., Wang, S., & Wang, X. (2018). Strategic best practices of flagship university professional development centers. *Professional Development in Education*. DOI: 10.1080/19415257.2018.1543722.

Kezar, A., & Eckel, P. (2000). *Moving beyond the gap between research and practice in higher education*. San Francisco, CA: Jossey-Bass.

Kimmel, K.M., & Fairchild, J.L. (2017). A Full-Time Dilemma: Examining the Experiences of Part-Time Faculty. *Journal of Effective Teaching*, *17*(1), 52-65.

Lapidus, J., Syverson, P., & Welch, S. (1995). Postgraduate research training in the United States. In S. Blume (Ed.), *Research training present and future*. Paris, France: OECD Publication Service.

Leslie, D. (2002). Resolving the dispute: Teaching is academe's core value. *The Journal of Higher Education, 73*(1), 49-73.

McDonald, K.S., & Waite, A.M. (2019). Future Directions: Challenges and Solutions Facing Career Readiness and Development in STEM Fields. *Advances in Developing Human Resources, 21*(1), 133-138.

Meyer, M. (2003). Academic entrepreneurs or entrepreneurial academics? Research-based ventures and public support mechanisms. *R&D Management*, *33*(2), 107-115.

Mitten, C., & Ross, D. (2018). Sustaining a commitment to teaching in a research-intensive university: What we learn from award-winning faculty. *Studies in Higher Education, 43*(8), 1348-1361.

Mwangi, C.A.G., Latafat, S., Hammond, S., Kommers, S., Thoma, H.S., Berger, J., & Blanco-Ramirez, G. (2018). Criticality in international higher education research: A critical discourse analysis of higher education journals. *Higher Education, 76*(6), 1091-1107.

Owens, B., & Jacob, W.J. (2019). Disciplines and Fields of Study. In *The SAGE Encyclopedia of Higher Education*. Thousand Oaks, CA: SAGE Publications.

Powell, W., & Owen-Smith, W. (1998). Universities as creators and retailers of intellectual property: Life-sciences research and commercial development. In B. Weisbrod (Ed.), *To profit or not to profit: The commercial transformation of the nonprofit sector* (pp. 169-193). New York, NY: Cambridge University Press.

Powers, J. (2004). R&D funding sources and university technology transfer: What is stimulating universities to be more entrepreneurial? *Research in Higher Education, 45*(1), 1-23.

Ran, F.X., & Xu, D. (2018). Does contractual form matter? The impact of different types of non-tenure track faculty on college students' academic outcomes. *Journal of Human Resources*, 0117-8505R.

Sav, G.T. (2016). Are American universities mismanaged?: Tenure vs non-tenure faculty employment decisions. *Information Management and Business Review, 8*(6), 19-31.

SCImago, (1997, 2007, 2018). SJR — SCImago journal & country rank [Portal]. Retrieved July 22, 2019, from http://www.scimagojr.com

Shin, J.C., Arimoto, A., Cummings, W.K., & Teichler, U. (2014). *Teaching and research in contemporary higher education*. Dordrecht, Netherlands: Springer.

Shin, J.C., Lee, S.J., & Kim, Y. (2013). Research collaboration across higher education systems: Maturity, language use, and regional differences. *Studies in Higher Education, 38*(3), 425-440.

Slaughter, S., & Leslie, L. (1997). *Academic capitalism: Politics, policies and the entrepreneurial university*. Baltimore, MD: Johns Hopkins University Press.

Smeltzer, S.C., Cantrell, M.A., Sharts-Hopko, N.C., Heverly, M.A., Jenkinson, A., & Nthenge, S. (2016). Assessment of the impact of teaching demands on research productivity among doctoral nursing program faculty. *Journal of Professional Nursing, 32*(3), 180-192.

Stupnisky, R.H., BrckaLorenz, A., Yuhas, B., & Guay, F. (2018). Faculty members' motivation for teaching and best practices: Testing a model based on self-determination theory across institution types. *Contemporary Educational Psychology, 53*(1), 15-26. Retrieved from https://doi.org/10.1016/j.cedpsych.2018.01.004

Suter, L.E., & Camilli, G. (2019). International Student Achievement Comparisons and US STEM Workforce Development. *Journal of Science Education and Technology, 28*(1), 52-61.

Teichler, U., Arimoto, A., & Cummings, W.K. (Eds.)(2013). *The changing academic profession: Major findings of a comparative survey*. Dordrecht, Netherlands: Springer.

West, C. (2018). The rise of international research collaboration. *International Educator, 27*(6), 30-37.

Wu, F., & Djurovic, G. (2018). 3I index: A new method to examine the competitiveness of countries' international publication productivity. *Malaysian Journal of Library & Information Science, 23*(1), 85-102.