Introducing the Postsecondary Instructional Practices Survey (PIPS):
A Concise, Interdisciplinary, and Easy-to-Score Survey of Postsecondary Instructional Practices

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Abstract
Researchers, administrators, and policy makers need valid and reliable information about teaching practices. The Postsecondary Instructional Practices Survey (PIPS) is designed to measure the instructional practices of postsecondary instructors from any discipline. The PIPS has 24 instructional practice statements and 9 demographic questions. Users calculate PIPS scores by an intuitive proportion-based scoring convention. Factor analyses from 72 departments at 4 institutions (N=827) support a 2- or 5-factor solution for the PIPS; both models include all 24 instructional practice items and have good model fit statistics. In this manuscript, we describe our development and validation processes, provide scoring conventions and outputs for results, and describe wider applications of the instrument.

Introduction
Efforts to improve teaching practices in undergraduate STEM education have been gaining attention in the United States. Organizations such as the American Association of Universities, Project Kaleidoscope, and others are engaging university staff and faculty in undergraduate STEM initiatives. These initiatives aim at cultivating public scientific literacy (e.g., Rutherford & Ahlgren, 1990), enhancing workforce readiness (e.g., Carnevale, Smith, & Melton, 2011), and increasing the competitiveness of the United States in the global economy (e.g. President’s Council of Advisors on Science and Technology, 2012). One method to achieve these aims is to encourage postsecondary instructors to adopt pedagogical approaches grounded in research on how people learn (e.g., Bransford, Brown, & Cocking, 2000). However, to understand the impact of pedagogical change initiatives (American Association for the Advancement of Science [AAAS], 2013), it is paramount to have reliable and valid methods to measure initial and continuing conditions.

The goal of this study was to design and validate an instrument to measure the instructional practices of postsecondary instructors. The resulting survey, the Postsecondary Instructional Practices Survey (PIPS), is interdisciplinary, concise, and can collect data quickly from a large number of participants. In this manuscript, we describe our development and validation processes, provide scoring conventions and outputs for results, and describe wider applications of the instrument.
Literature Review

There are many potential methods to measure instructional practices. These include faculty surveys, student surveys, interviews, class observations, and portfolio/artifact analysis (AAAS, 2013). We see faculty self-report as a particularly useful method since surveys are easy to administer and can get at instructional practices that are difficult for others to observe. For example, compared to self-report surveys, peer and protocol-based observations can be expensive and difficult to implement at scale.

One concern about surveys is that instructors may inaccurately self-report their teaching practices. There has been limited study of this issue and the results are currently inconclusive. One study found that, on self-report surveys, instructors overestimate the amount of student interactivity in their classrooms as compared to the ratings of trained observers (Ebert-May, Derting, Hodder, Momsen, Long, & Jardeleza, 2011). However, in a study with better alignment of survey items and observation codes, observational data support and align with self-report from instructors (Smith, Vinson, Smith, Lewin, & Stetzer, 2014). This second study suggests that there are aspects of instruction that instructors can accurately self-report. We expect good alignment of the PIPS with common observation protocols, as our survey was developed from a critical analysis of the literature (Authors, in review) and because the PIPS conceptual framework was developed in part from the observational protocol codes of the Teaching Dimensions Observational Protocol (TDOP; Hora, Oleson, & Ferrare, 2012) and the Reformed Teaching Observation Protocol (RTOP; Piburn et al., 2000). Initial data from our case studies in progress indicate PIPS self-report data align with TDOP data.

When we began exploring the idea of building our own instrument, we first considered existing surveys of instructional practice. Over the past decade, the literature has blossomed with instruments of this nature, including 10 surveys summarized in AAAS (2013) and the Teaching Practice Inventory (TPI) by Wieman and Gilbert (2014). Authors (in review) examined the nature these surveys in a detailed item- and instrument-level analysis. We note that despite 11 published surveys of instructional practices, none are designed to elicit teaching practices (and only teaching practices) from an interdisciplinary group of postsecondary instructors.

Most available instruments are designed to survey faculty from a specific discipline, and therefore may contain discipline-specific jargon. Unless these surveys are revalidated for new populations, they should only be used for their intended populations to preserve face validity (DeLamater, Myers, & Collett, 2014). Discipline-specific surveys include those designed for chemistry and biology faculty (Marbach-Ad, Schaefer-Zimmer, Orgler, Benson, & Thompson, 2012), engineering faculty (Borrego, Cutler, Prince, Henderson, & Froyd, 2013; Brawner, Felder, Allen, & Brent, 2002), geoscience faculty (MacDonald, Manduca, Mogk, & Tewksbury, 2005), physics faculty (Dancy & Henderson, 2010), statistics faculty (STI; Zieffler, Park, Garfield, delMas, & Bjornsdottir, 2012), and math and science faculty (TPI, Wieman & Gilbert, 2014).

The remaining 4 surveys of instructional practices are interdisciplinary and have been validated for use with instructors from all disciplines. Surveys of this nature have found important differences between the self-reported teaching practices of instructors from different
disciplines. For example, the 2011-2012 HERI faculty survey indicated that 62% of faculty members in STEM use “extensive lecturing” in all or most of the courses they teach, compared to 36% in all other fields (Hurtado, Eagan, Pryor, Whang, & Tran, 2011).

One potential disadvantage to using large-scale nationwide surveys is that they elicit a wide range of elements about teaching and the academic workplace. Only a fraction of the items on these instruments elicit actual teaching practices. The Approaches to Teaching Inventory (ATI), for example, has some items about teaching but also several items about the instructor’s beliefs about and goals for teaching (Trigwell & Prosser, 2004). Other instruments elicit a variety of academic workplace features, such as faculty perceptions of institutional climate and relationships with campus staff. These surveys include the Faculty Survey of Student Engagement (FSSE; Center for Post-secondary Research at Indiana University, 2012), HERI (Hurtado et al., 2011), and NSOPF (National Center for Educational Statistics [NCES], 2004). Two of these are available solely on a proprietary basis (FSSE, HERI).

Lastly, we note that many existing instruments (discipline-specific and interdisciplinary) use inconsistent item scales, complicated scoring conventions, and potentially bias-generating educational jargon (e.g. inquiry, problem-based learning, and authentic research practices; Authors, in review). Several are also lengthy. For example, the FSSE has 130 items (Center for Postsecondary Research, 2012) and the NSOPF has 83 items and takes 30 minutes to complete (NCES, 2004).

Based on our analysis of the current state of instruments for measuring teaching practices, we decided that there was a need for a new instrument that met the following design criteria: 1) applicable across all undergraduate disciplines, 2) succinct and easy to administer, 3) uses an intuitive scoring convention, and 4) available to any user on a non-proprietary basis. With these principles in mind, we began to design the PIPS.

Methodology

Our goal was to design an interdisciplinary, succinct, and psychometrically sound survey of postsecondary instructional practices. The resulting survey, the Postsecondary Instructional Practices Survey (PIPS), is valid, reliable, easy-to-use, and available on a non-proprietary basis.

Research Questions

This paper will describe the development of the PIPS and answer the following questions:

- **RQ1.** Does the PIPS have content, face, and construct validity for measuring the teaching practices of postsecondary instructors?
- **RQ2.** Do PIPS items group together into measurable and reliable variables?
- **RQ3.** What are some of the emergent patterns in the PIPS data among the 4 surveyed institutions and 72 surveyed departments?

Conceptual Framework

We drew from the empirical and theoretical literature as we developed the PIPS. There is an extensive literature base that describes research on instructional practices (e.g., Pascarella &
Terenzini, 1991; 2005), but no standard conceptual model. We therefore shaped our items and conceptual categories by finding themes in the (a) research on instructional practice, (b) teaching observation protocols and (c) existing self-report teaching practice surveys.

We compiled 153 items by combining applicable items and concepts from the four interdisciplinary instructional practice surveys (ATI, FSSE, HERI, NSOPF) and two observational protocols (RTOP, TDOP). These items and codes were triangulated by themes in four comprehensive literature reviews (Iverson, 2011; Meltzer & Thornton, 2012; Pascarella & Terenzini, 1991; 2005). For example, PIPS item P02, “I design activities that connect course content to my students’ lives and future work” stems from the TDOP code for making connections to own lives and specific cases (Hora et al., 2012). PIPS item P04, “I provide my students with immediate feedback on their work during class,” stems from FSSE Item FFEED: “(Students) received prompt written or oral feedback from you on their academic performance.” Iverson (2011) also notes this as an effective practice.

We reduced and revised an initial set of 153 items by removing redundant items, items that did not refer to actual teaching practices (i.e., beliefs about teaching or intent to teach in a given manner), and checklists of generalized practices (e.g., “lecture”, “lecture with demonstration”, “multiple choice tests”). In addition, we excluded use of instructional technologies on the PIPS (e.g. simulations, pointers, digital tablets). In principle, we consider instructional practices to be transcendent of technology; PIPS practices can be implemented with or without the use of technology.

As we reduced and revised the initial set of items, we organized them into 4 conceptual categories: instructor-student interactions, student-content interactions, student-student interactions, and assessment (Table 1). These are not the only categories by which one could sort the items, but we found conceptual categories helpful in understanding the nature of available instructional practice survey questions, and used the categories to generate our own items.

**Item Generation**

Using the four conceptual categories as a guiding framework, we went through multiple rounds of item generation (43 new items) and revision or removal of the original 153 items. The final version of the PIPS has 24 instructional practice items (13 new, 11 revised). It was our goal to generate a broad range of instructional practices, but not an inventory of all possible instructional practices. It was also not our goal to have an equal number of items in each conceptual category.

We wrote items to reduce the potential for eliciting socially acceptable responses. This was especially important when writing statements that describe more traditional, transmission-based teaching approaches. We set the tone of the PIPS by starting the survey with a statement that describes such an approach. We did not downplay this approach as “just lecture” but rather “I guide students through major topics as they listen and take notes” (P01). Item P03 is similarly non-evaluative: “My syllabus contains the specific topics that will be covered in every class session.”
Four education researchers from an outside institution revised the items for clarity. For example, Item P05, originally from the ATI (Trigwell & Prosser, 2004) was revised to remove *unnecessary words*: “I design my course with the assumption that most students have *very* little *useful* knowledge of the topics to be covered.” Items were also eliminated or revised if they elicited more than one teaching practice (i.e., items could not be double-barreled; Clark & Watson, 1995; Podsakoff, MacKenzie, & Podsakoff, 2012). For example, Iverson (2011) describes groups formed by students, the teacher, or the researcher as a common social learning approach. As a statement on a survey, this concept would be double-barreled. Instead, we chose to write the item for this concept based on RTOP Code 18 (Piburn et al., 2000): “*I structure class so that students regularly talk with one another about course concepts.*” This text became PIPS Item P12.

**Intended Population and Context**

Any postsecondary instructor from any discipline can be surveyed with the PIPS, including full- and part-time instructors, graduate students, and instructional staff. For the data reported in this paper, we asked participants to respond to PIPS statements in reference to teaching the largest enrollment, lowest level course they have taught in the last two years. We believe this setting is one of the most challenging in which to use research-based instructional strategies in comparison to smaller enrollment, higher-level courses. This setting is also of primary concern to researchers, funding agencies, and policy makers interested in instructional change (e.g. AAAS, 2013).

**Scale**

The PIPS requires respondents to rate instructional practice statements on a scale of *descriptiveness*. We selected a 5-point Likert-style scale, as recommended by Bass, Cascio, and O’Conner (1974) to produce maximum variance with minimum response overlap. There is no neutral point on the scale, as removing a neutral option from the scale generates better variability in the data (Bishop, 1987; Johns, 2005). Response options include:

- Not at all descriptive of my teaching (0)
- Minimally descriptive of my teaching (1)
- Somewhat descriptive of my teaching (2)
- Mostly descriptive of my teaching (3)
- Very descriptive of my teaching (4)

**Data Sources**

We surveyed 827 postsecondary instructors from four institutions of higher education in the United States (Table 2). The survey was administered online using Qualtrics and the overall response rate was 33.2% (827/2494). Our research team administered the survey at Institutions A and C and researchers at other institutions administered the survey (with our guidance) at Institutions C and D.
Analyses

We ran factor analyses to examine which items consistently loaded together. The sample had an acceptable Kaiser-Meyer-Olkin Measures of Sample Adequacy (KMO = 0.879) and significant Bartlett’s Tests of Sphericity ($p < 0.05$). Analysis followed Hu and Bentler’s (1995) recommendations for evaluating model fit. We first ran exploratory factor analyses (EFA) to identify dimensions of teaching practice using maximum-likelihood extraction with Promax rotation. Competing models (e.g., a four-dimensional vs. five-dimensional model) were compared using the likelihood ratio test under the null hypothesis that a more complex model does not significantly improve fit with the data at $p < 0.05$.

We also completed confirmatory factor analyses (CFA) to evaluate structural equation models determined by our qualitative categorization of the items. We evaluated goodness of fit of the hypothesized models by using the root mean square error of approximation (RMSEA; Steiger, 2000), Chi-squared/df below 5.0 (Bollen, 1989), and a comparative fit index (CFI) near 0.90 (Hu & Bentler, 1999; Byrne, 2013). Guidelines for acceptable model fit statistics values vary. Hu and Bentler (1995) suggest an RMSEA of 0.06 as indicative of a good-fitting model. MacCallum, Browne and Sugawara (1996) suggest values of 0.01, 0.05, and 0.08 as indicative of excellent, good, and mediocre fit, respectively. Our model fit statistics are in Table 3.

We also ran ANOVA, independent t-tests, and correlational analyses to examine differences in groups of interest to see if PIPS could identify group differences in instructional practices and if those differences were similar to other claims in the literature.

Results

RQ1. Does the PIPS have content, face, and construct validity for measuring the teaching practices of postsecondary instructors?

Content and Face Validity. An instrument has face validity if, from the perspective of participants, it appears to have relevance and measure its intended subject. This requires developers to use clear and concise language, avoid jargon, and write items to the education and reading level of the participants (DeLamater et al., 2014). Content validity, in contrast, documents how well an instrument represents aspects of the subject of interest (in our case, instructional practices). A panel of subject matter experts is often used to improve content validity through refinement or elimination of items (Anastasi & Urbina, 1997). In order to achieve both content and face validity, we field-tested the PIPS in its entirety with a sample of non-participating instructors (N=5) and a panel of education researchers at another institution (N=4). This process allowed for items to be revised for clarity, accuracy of content, and relevancy.

Construct Validity. Construct validity refers to the degree an instrument is consistent with theory (Coons, Rao, Keiningher, & Hays, 2000) and is often achieved through confirmatory and/or exploratory factor analyses (Thompson & Daniel, 1996). The PIPS produces both 2-
factor and 5-factor solutions that are consistent with theory on how people learn (e.g. Bransford et al., 2000) and the nature of assessment practice (Angelo & Cross, 1993); we detail this in the Factor Analyses section below.

RQ2. Do PIPS items group together into measurable and reliable variables?

Reliability. The PIPS has an overall instrument reliability of $\alpha=0.800$. This value cannot be substantially improved with removal of any of the 24 items. We include respective construct reliabilities in Tables 5 and 6.

Factor Analyses. We conducted factor analyses after confirming an acceptable Kaiser-Meyer-Olkin Measures of Sample Adequacy ($KMO = 0.879$) and significant Bartlett’s test of sphericity ($\chi^2 (276) = 5149.713; p = 0.00$). Exploratory and confirmatory factor analyses support two scoring models for the PIPS, a 2-factor solution and a 5-factor solution. Both models use all 24 instructional practice items and are supported by moderate to good fit statistics (Table 4). We present both the 2-factor and 5-factor options for scoring the PIPS, as the different models satisfy different model fit criteria and because coarse- and fine-grained instructional practice scores provide different information for users.

We considered other models supported by the data, including a 4-factor and 10-factor option (and other less-statistically supported solutions). The 4-factor solution is supported by Kaiser criterion, that is, we have four factors with Eigenvalues over 1.0. However, the 4-factor model requires some of the 24 items to be removed and has less logical item groupings than the 5-factor model. The 10-factor solution has the lowest number of factors supported by a Chi-squared goodness-of-fit test ($\chi^2 (81) = 105.698; p = 0.034$). However, the 10-factor solution has some factors with only 1 item per factor (and as such, these factors should be removed; Costello and Osborne, 2005). Furthermore, since we have simpler models with acceptable model fit statistics, the 10-factor solution is not the most parsimonious (Ferguson, 1954).

Scoring Option A - The 2-Factor Scoring Option

One option for scoring the PIPS is a 2-factor (2F) scoring option, including one factor that describes “Student-Centered Practice” (15 items) and the other that describes “Instructor-Centered Practice” (9 items; Table 5). We operationally define these factors in Table 4. We selected the 2F model through exploratory factor analysis using a maximum likelihood method with Promax rotation. We extracted the data into sequentially more complex models (i.e. a 1-factor model, then 2-factor, then 3-factor, etc.). Our goal was to find the simplest model supported by acceptable model fit statistics that also was supported by qualitatively logical item groupings (Table 5).

Scoring Option B - The 5-Factor Scoring Option

The PIPS data also support a 5-factor (5F) scoring option. This model provides more detail on the instructional practices of a participant or group of interest than the 2F model. The 5F model was first generated by an apriori qualitative categorization of the items that we refined.
and confirmed through structural equation modeling. We originally had 4 apriori PIPS categories (Table 1). However, since the 4-factor CFA would require removal of items of interest, we found we could maintain good model fit statistics if the assessment factor split into two factors, formative assessment (5 items) and summative assessment (4 items). After confirming that the 5F model had good model fit statistics in the CFA, we renamed the constructs in the model to match their respective items. Factors in the 5F model include (a) student-student interactions, 6 items; (b) content delivery, 4 items; (c) formative assessment, 5 items; (d) student-content engagement, 5 items; and (e) summative assessment, 4 items (Table 6). We operationally define these factors in Table 4.

**How to Calculate PIPS Scores**

PIPS scores are calculated for each factor by calculating the proportion of possible points for that factor. Thus, to calculate a factor score from either PIPS model (2F or 5F), begin by adding scores for the items in that factor (see Tables 5 and 6 for items in each factor). Continue by dividing by the maximum possible sum for that factor and then multiply by 100.

For example, calculate the *Content Delivery* score by first adding actual scores from items P01, P03, P05, and P11. Since each PIPS item can be rated as high as 4 (very descriptive of my teaching), and there are 4 items in this factor, the maximum possible sum for *Content Delivery* is 16. Divide the actual factor sum by 16 and multiply by 100 to generate a *Content Delivery* factor score between 0 and 100.

**Sample Score Calculation (for Content Delivery)**

Step 1. Σ (P01, P03, P05, P11) = Actual Factor Sum

Step 2. (Actual Factor Sum / Maximum Possible Sum); 16 = Maximum Possible Sum

Step 3. (Actual Factor Sum / Maximum Possible Sum)*100 = Factor Score

Each factor score has a value between 0 (not at all descriptive of my teaching) and 100 (very descriptive of my teaching). Individual factor scores can be combined to generate mean scores for groups of interest, for example, to make comparisons between departments, institutions, or demographic subgroups.

**Examining Institutional, Departmental, and Demographic Differences**

This section includes discriminant outputs that can be generated from the PIPS that document differences in institutional, department, and demographic groups of interest.

**PIPS Histogram.** PIPS 2-factor and 5-factor scores can be represented on a frequency-based bar graph with each score on a horizontal axis (Figures 1 and 2). This representation denotes factor scores as a proportion of the maximum sum score for a factor (100) and how each value fits with the original scale for the PIPS from *not at all descriptive* (0) to *very descriptive* (100). This representation can also be used to highlight significant differences in factor scores among groups of interest (i.e. institutions; Figure 2).
**PIPS Scatterplot.** PIPS 2-factor scores can be placed on an x-y scatterplot based on the orthogonal (independent) nature of the factors. The orthogonal nature of the factors is supported by no significant correlation between them ($r(703) = 0.026; p = 0.492$) and consistent item loadings between EFA rotation methods; i.e. the 2-factor item loadings for a Varimax rotation (used for orthogonal data) are equivalent to the 2-factor item loadings on a Promax rotation with Kaiser normalization (for oblique data).

In generating a scatterplot of the factors, we find it helpful to place the crossing of the axes for a 2-factor scatterplot at the midpoint (50, 50). This generates a matrix of instructor-centered and student-centered practices with varying degrees of descriptiveness from 0 to 100 (Figures 3 and 4).

**RQ3. What are some of the emergent patterns in the PIPS data among the 4 surveyed institutions and 72 surveyed departments?**

We completed independent t-tests and ANOVA comparisons to explore demographic differences between and among PIPS scores for different instructor groups. We found significant differences in PIPS scores by gender, between graduate student instructors and faculty, and between STEM and non-STEM faculty (Figure 6). We also found significant differences in PIPS scores among faculty of differing academic rank (Figure 7). ANOVA revealed student-centered practice (2F) as significantly different among ethnic groups ($p = 0.043$), but post-hoc tests did not confirm significant differences. Other means from the 2F and 5F models likewise were not significantly different among ethnic groups.

We conducted correlational analyses to examine the relationship among PIPS factors and class size, years teaching, and years at the institution (Table 7). We also report correlations among PIPS factor scores and self-reported proportions of time spent in lecture, doing small group work, providing individualized instruction, or doing other forms of instruction (Table 8).

Lastly, based on the significant correlation between class size and PIPS scores, we compare PIPS scores by discipline but controlled for class size. We found that STEM instructors describe the content delivery (5F), summative assessment (5F), and instructor-centered practice (2F) factors as significantly more descriptive of their instruction than non-STEM instructors ($p < .05$). In contrast, when controlling for class size, mean PIPS scores of STEM instructors do not significantly differ from non-STEM instructors for the student-student interactions (5F), formative assessment (5F), or student-centered practice (2F) factors ($p > .05$).

**Discussion**

Valid and reliable measurement of instructional practices in higher education settings allows researchers, administrators, and other interested parties to plan for and evaluate reform initiatives (AAAS, 2013). Although 11 surveys of instructional practices are already available, none elicit teaching practices (and only teaching practices) from postsecondary instructors in any discipline (Authors, *in review*). The PIPS can differentiate among coarse- and fine-grained
elements of the instructional practices of postsecondary instructors from any discipline. Furthermore, the PIPS is valid, reliable, easy-to-score, and can quickly collect data from a large number of participants.

Interpreting PIPS Outputs

Although the information available through individual PIPS responses may be helpful for a single instructor, our study identifies institutional and departmental clusters in instructional practices (Figures 3, 4, 5). These clusters support the notion that instructional practices are normative at both the institution and department level. Since instructional change is more successful when emergent from a group (Henderson, Beach, & Finkelstein, 2011), and the PIPS can identify institutional and departmental instructional practice clusters, we see longitudinal shifts in PIPS data for a group to be especially useful in measuring the success of change initiatives. Further, identifying clusters in PIPS results by department and institution supports the discriminant ability of the PIPS and highlights its usefulness as a measurement tool.

Demographic Differences

The primary purpose of this paper was to highlight the development and validation of the PIPS. We are providing demographic findings to illustrate potentially useful data presentations, document the discriminant ability of the PIPS, and to situate our results in the greater body of literature. Consistency of PIPS scores with prior literature supports the validity of the PIPS and its usefulness as a measurement tool.

By Class Size. Faculty often mention class size as a barrier to incorporating research-based instructional strategies (Dancy & Henderson, 2007; MacDonald et al., 2005; Waleyck & Ramsey, 2003). We likewise note that class size had a significant positive correlation with more traditional teaching practices as described by items in the content delivery ($r = 0.131; p < .05$) and summative assessment ($r = 0.137; p < .05$) factors. We also found significant negative correlation with class size and student-student interactions ($r = -0.122; p < .05$). Henderson, Dancy, and Niewiadomska-Bugaj (2012) likewise found a negative correlation between class size and student-centered pedagogies.

By Discipline. We found significant differences between STEM (N=438) and non-STEM (N=389) instructors across several PIPS factors. Instructors from non-STEM disciplines were significantly more likely than STEM instructors to describe student-centered practice (2F) as descriptive of their teaching ($p < 1E-9$). Similarly, STEM instructors were significantly more likely to describe instructor-centered practice (2F) as descriptive of their teaching ($p < 1E-9$). This is consistent with the finding that lecture-based pedagogies are more prevalent among STEM instructors than among instructors from other disciplines (e.g. Hurtado et al. 2011).

Our findings differ somewhat when controlling for class size. We support the conclusion that STEM instructors have significantly higher scores than non-STEM instructors in instructor-centered practice (2F), content delivery (5F), and summative assessment (5F) factors ($p < .05$). In contrast, when controlling for class size, STEM instructors from our sample did not have
significantly different scores than non-STEM instructors for student-centered practice (2F), student-student interactions (5F), and formative assessment (5F) \( (p > .05) \). This suggests that student-centered practices are more mediated by class size (e.g. Walczek & Ramsey, 2003) than by nature of the content.

**By Gender.** Instructor-centered practices (2F) were significantly more descriptive of male instructors than female instructors \( (p < .01) \). This factor includes statements such as “students listening and taking notes” and “teaching with the assumption that students have little incoming knowledge.” Similarly, the content delivery (5F) and summative assessment (5F) factors were significantly more descriptive of male instructors than female instructors \( (p < .05) \). Henderson et al. (2012) and Kuh, Laird, and Umbach (2004) likewise found women using fewer instructional practices of this nature. In contrast, we did not identify gender differences for factors that describe more research-based instructional strategies. Mean scores for student-centered practice (2F), student-student interactions (5F), student-content engagement (5F), and formative assessment (5F) were not significantly different by gender.

**By Years Teaching.** More senior faculty are often thought to be less innovative than younger faculty (Kuh et al., 2004; Hativa, 2000). However, when controlling for other study variables, Henderson et al. (2012) did not find a correlation to teaching practices and years teaching. We note that years teaching was significantly correlated with instructor-centered practice (2F), content delivery (5F), and summative assessment (5F), supporting Kuh et al. (2004) and Hativa (2000). However, we also note that years teaching was not significantly correlated with student-centered practice (2F), nor were years teaching correlated to student-student interactions (5F), student-content engagement (5F), and formative assessment (5F).

**Utility of PIPS Scatterplots**

One question that arises with the use of the PIPS scatterplots is whether it is meaningful to be in different quadrants. We do not know if the quadrants represent distinct populations of instructors. When interpreting the scatterplots, it is important to remember that the 0-100 scales are not a proportion of class time, but rather how descriptive a given factor is for the respondent. It is possible for an instructor to describe both instructor-centered practices and student-centered practices as somewhat (50) to very descriptive (100) of their teaching, placing them in the upper right quadrant.

We find the quadrants helpful for highlighting institutional and departmental differences, as in Figures 3 and 4. We suspect that there are meaningful differences among the quadrants, but are not able verify this suspicion in the current study. We also see the quadrants as helpful in documenting the face validity of the PIPS, that is, most instructors surveyed are able to find PIPS items that they feel represent their instructional practices. This is confirmed by a low number of individuals in the lower left quadrant of the multi-institutional scatterplot (48 of 687 respondents).
Implications for Policy

It is important for researchers, institutions, and policy makers to have a valid and reliable instrument that can describe a range of traditional and research-based teaching practices across instructors from multiple departments. This can be useful, for example, to identify outlier departments (positive deviants that can be learned from) or to document the results of change initiatives longitudinally.

Future Work

One of our next steps will be to triangulate the results of the PIPS with teaching observation data collected using the TDOP (Hora et al., 2012) and interviews with instructors. These observations will provide additional support for our constructs and help to identify what, if anything, is lost in using the PIPS over a more resource-intensive observation. We expect to see reasonable alignment of instructional practices reported by the PIPS with those observed by the TDOP, especially since the TDOP was used as a reference for developing PIPS items.

Access to the Instrument

The PIPS is available in its paper form in the Appendix. Users are also welcome to contact the authors for use of the PIPS in its Qualtrics form. If you use the PIPS, we request that you use it in its entirety and share the data with our research team. We also suggest that you consider using the PIPS with its companion instrument, the Authors’ Climate Survey (Authors, 2014). This will help us to improve both instruments and contribute to an improved research-based understanding of how elements of the academic workplace influence instructional practices.
References


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Table 1. Operational definitions and sources of conceptual categories used to develop items on the PIPS.

<table>
<thead>
<tr>
<th>Conceptual Category</th>
<th>Definition</th>
<th>Definition Source</th>
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<tbody>
<tr>
<td>Instructor-Student interactions</td>
<td>Practices that influence the classroom relationship between the instructor and students (e.g., the role of the instructor in class sessions).</td>
<td>Self-generated</td>
</tr>
<tr>
<td>Student-content interactions</td>
<td>Practices that influence how students interact with course concepts (e.g., reflection activities, connecting concepts to students’ lives).</td>
<td>Self-generated</td>
</tr>
<tr>
<td>Student-student interactions</td>
<td>Practices that influence the classroom interactions among students. These approaches include classroom discourse, small group work, and other collaborative approaches.</td>
<td>Self-generated</td>
</tr>
<tr>
<td>Assessment</td>
<td>Practices that provide feedback to students and the instructor on what, how much, and how well students are learning (Angelo &amp; Cross, 1993). This includes what is assessed, how often students are assessed, how instructors use assessment data, and grading.</td>
<td>Angelo and Cross, 1993, p. 4 (modified)</td>
</tr>
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Table 2. Demographic and sample size information for the surveyed institutions.

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<thead>
<tr>
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<th>Institution A</th>
<th>Institution B</th>
<th>Institution C</th>
<th>Institution D</th>
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<tbody>
<tr>
<td>N</td>
<td>152</td>
<td>164</td>
<td>87</td>
<td>424</td>
</tr>
<tr>
<td>Departments Surveyed</td>
<td>13</td>
<td>9</td>
<td>10</td>
<td>40</td>
</tr>
<tr>
<td>Response Rate</td>
<td>37.1%</td>
<td>64.1%</td>
<td>27.7%</td>
<td>28.0%</td>
</tr>
<tr>
<td>Disciplines</td>
<td>STEM and Applied sciences</td>
<td>STEM</td>
<td>Biological Sciences</td>
<td>All Departments</td>
</tr>
<tr>
<td>Instructors Surveyed</td>
<td>Full- and Part-Time faculty; Graduate students</td>
<td>Full- and Part-Time faculty</td>
<td>Full-Time faculty</td>
<td>Full- and Part-Time faculty; Graduate students</td>
</tr>
<tr>
<td>U.S. Region</td>
<td>Midwest</td>
<td>East</td>
<td>Southeast</td>
<td>Mountain West</td>
</tr>
<tr>
<td>Control</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
<td>Public</td>
</tr>
<tr>
<td>Carnegie Classification</td>
<td>Research Univ. High research activity</td>
<td>Research Univ. Very High research activity</td>
<td>Research Univ. Very High research activity</td>
<td>Masters College or University (Larger program)</td>
</tr>
<tr>
<td>Student Population</td>
<td>25K</td>
<td>28K</td>
<td>34K</td>
<td>22K</td>
</tr>
</tbody>
</table>
Table 3. Postsecondary Instructional Practices Survey (PIPS) model fit statistics for 2- and 5-factor solutions.

<table>
<thead>
<tr>
<th>Model Fit Criteria</th>
<th>2-Factor Solution</th>
<th>5-Factor Solution</th>
</tr>
</thead>
<tbody>
<tr>
<td>Chi-Squared ($\chi^2$)</td>
<td>920.316</td>
<td>1070.026</td>
</tr>
<tr>
<td>DF</td>
<td>229</td>
<td>239</td>
</tr>
<tr>
<td>Chi-Squared/DF</td>
<td>4.02</td>
<td>4.48</td>
</tr>
<tr>
<td>Comparative Fix Index (CFI)</td>
<td>0.811</td>
<td>0.832</td>
</tr>
<tr>
<td>Root Mean Square Error of Approximation (RMSEA)</td>
<td>0.066</td>
<td>0.071</td>
</tr>
<tr>
<td>Variance Explained</td>
<td>37.75%</td>
<td>52.76%</td>
</tr>
<tr>
<td>Meets Scree Plot Criterion</td>
<td>Yes</td>
<td>No</td>
</tr>
</tbody>
</table>
Table 4. Operational definitions for the Postsecondary Instructional Practices Survey (PIPS) factors.

<table>
<thead>
<tr>
<th>Factor</th>
<th>Model</th>
<th>Operational Definition</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor-Centered Practices</td>
<td>2-Factor</td>
<td>Practices that emphasize the presentation of information and the design of summative assessment.</td>
</tr>
<tr>
<td>Student-Centered Practices</td>
<td>2-Factor</td>
<td>Practices that emphasize structuring the class so that students interact with one-another, engage deeply with the content, and receive formative feedback.</td>
</tr>
<tr>
<td>Student-Student Interactions</td>
<td>5-Factor</td>
<td>Practices that describe interactions among students in class.</td>
</tr>
<tr>
<td>Content Delivery</td>
<td>5-Factor</td>
<td>Practices that describe how the instructor presents information to the students.</td>
</tr>
<tr>
<td>Student-Content Engagement</td>
<td>5-Factor</td>
<td>Practices that encourage students to manipulate or generate learning materials or products beyond what was provided (similar to active and constructive elements noted by Chi and Wylie, 2014).</td>
</tr>
<tr>
<td>Formative Assessment</td>
<td>5-Factor</td>
<td>Practices to monitor student learning that provide feedback to the instructor to inform teaching and/or to students to inform their learning.</td>
</tr>
<tr>
<td>Summative Assessment</td>
<td>5-Factor</td>
<td>Practices to formally evaluate student learning, including grading policies.</td>
</tr>
</tbody>
</table>
Table 5. Postsecondary Instructional Practices Survey (PIPS) factor reliability scores, model fit statistics, and items by factor for a 2-factor scoring solution.

<table>
<thead>
<tr>
<th></th>
<th>Factor 1: Student Centered Practice</th>
<th>Factor 2: Instructor Centered Practice</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability (α)</td>
<td>0.877</td>
<td>0.677</td>
</tr>
<tr>
<td>Number of Items</td>
<td>15</td>
<td>9</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>5.774</td>
<td>3.285</td>
</tr>
<tr>
<td>Percent Variance Explained</td>
<td>24.059%</td>
<td>13.686%</td>
</tr>
<tr>
<td>Items</td>
<td>P02, P04, P06, P07, P08, P09, P10, P12, P13, P14, P15, P16, P18, P19, P20</td>
<td>P01, P03, P05, P11, P17, P21, P22, P23, P24</td>
</tr>
<tr>
<td>Maximum Possible Sum</td>
<td>60</td>
<td>36</td>
</tr>
<tr>
<td>Sample Items</td>
<td>I structure class so that students regularly talk with one another about course concepts</td>
<td>My class sessions are structured to give students a good set of notes.</td>
</tr>
<tr>
<td></td>
<td>I structure class so that students discuss the difficulties they have with this subject with other students.</td>
<td>I guide students through major topics as they listen and take notes.</td>
</tr>
</tbody>
</table>
Table 6. Postsecondary Instructional Practices Survey (PIPS) factor reliability scores, model fit statistics, and items by factor for a 5-factor scoring solution.

<table>
<thead>
<tr>
<th>Factor 1: Student-Student Interactions</th>
<th>Factor 2: Content Delivery Practices</th>
<th>Factor 3: Formative Assessment</th>
<th>Factor 4: Student-Content Engagement</th>
<th>Factor 5: Summative Assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>Reliability ($\alpha$)</td>
<td>0.825</td>
<td>0.641</td>
<td>0.606</td>
<td>0.447</td>
</tr>
<tr>
<td>Number of Items</td>
<td>6</td>
<td>4</td>
<td>5</td>
<td>5</td>
</tr>
<tr>
<td>Eigenvalue</td>
<td>5.744</td>
<td>3.285</td>
<td>1.351</td>
<td>1.258</td>
</tr>
<tr>
<td>Percent Variance Explained</td>
<td>24.059%</td>
<td>13.686%</td>
<td>5.629%</td>
<td>5.240%</td>
</tr>
<tr>
<td>Items</td>
<td>P10, P12, P13, P14, P15, P19</td>
<td>P01, P03, P05, P11</td>
<td>P04, P06, P08, P18, P20</td>
<td>P02, P07, P09, P16, P17</td>
</tr>
<tr>
<td>Maximum Possible Sum</td>
<td>24</td>
<td>16</td>
<td>20</td>
<td>20</td>
</tr>
<tr>
<td>Sample Item</td>
<td>I structure class so that students regularly talk with one another about course concepts.</td>
<td>I guide students through major topics as they listen and take notes.</td>
<td>I use student assessment results to guide the direction of my instruction during the semester.</td>
<td>I design activities that connect course content to my students' lives and future work.</td>
</tr>
</tbody>
</table>
Table 7. PIPS factor correlations with class size, years teaching, and years at institution.

<table>
<thead>
<tr>
<th>Factor PIPS Model</th>
<th>Class Size</th>
<th>Years Teaching</th>
<th>Years at Institution</th>
</tr>
</thead>
<tbody>
<tr>
<td>2-Factor PIPS Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Instructor Centered Practice</td>
<td>.098</td>
<td>.187**</td>
<td>.163**</td>
</tr>
<tr>
<td>Student Centered Practice</td>
<td>-.095</td>
<td>.059</td>
<td>.049</td>
</tr>
<tr>
<td>5-Factor PIPS Model</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Content Delivery</td>
<td>.131*</td>
<td>.106</td>
<td>.111</td>
</tr>
<tr>
<td>Summative Assessment</td>
<td>.137*</td>
<td>.141*</td>
<td>.123*</td>
</tr>
<tr>
<td>Student-Student Interactions</td>
<td>-.122*</td>
<td>.027</td>
<td>.023</td>
</tr>
<tr>
<td>Student-Content Engagement</td>
<td>-.081</td>
<td>.116</td>
<td>.094</td>
</tr>
<tr>
<td>Formative Assessment</td>
<td>-.034</td>
<td>-.049</td>
<td>-.093</td>
</tr>
<tr>
<td>Class Size</td>
<td>1</td>
<td>.051</td>
<td>.011</td>
</tr>
<tr>
<td>Years Teaching</td>
<td>1</td>
<td></td>
<td>.864**</td>
</tr>
<tr>
<td>Years at Institution</td>
<td></td>
<td></td>
<td>1</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
Table 8. Pearson correlations among PIPS factor scores (2-factor model) and participant estimations of how time is spent in class: doing lecture, small group work, individualized instruction, and other instruction.

<table>
<thead>
<tr>
<th>Instructor Centered Practice</th>
<th>Student Centered Practice</th>
<th>Estimated % Lecture</th>
<th>Estimated % Small Group</th>
<th>Estimated % Individual Instruction</th>
<th>Estimated % Other Instruction</th>
</tr>
</thead>
<tbody>
<tr>
<td>Instructor Centered Practice</td>
<td>1</td>
<td>.026</td>
<td>.318**</td>
<td>-.360**</td>
<td>-.051</td>
</tr>
<tr>
<td>Student Centered Practice</td>
<td>1</td>
<td>-.409**</td>
<td>.258**</td>
<td>.206**</td>
<td>.275**</td>
</tr>
</tbody>
</table>

** Correlation is significant at the 0.01 level (2-tailed)
* Correlation is significant at the 0.05 level (2-tailed)
Figure 1. PIPS 2-factor and 5-factor scores for an individual instructor from Institution A.
Figure 2. Institutional differences in mean PIPS 2-factor scores by institution.

*Note.* Significant differences based on post-hoc Scheffe tests: (a) Institutional mean significantly different than the other 3 institutions ($p<.05$); (b) Institutional mean significantly lower than the 2 higher scoring institutions ($p<.05$); (c) Institutional mean significantly different than the highest and lowest scoring institutions ($p<.05$); (d) Institutional mean significantly lower than the highest scoring institution, but not the other 2 institutions ($p<.05$); (e) Institutional mean significantly higher than the lowest scoring institution, but not the other 2 institutions ($p<.05$); (f) Institutional mean significantly higher than the 2 lowest scoring institutions ($p<.05$).
Figure 3. PIPS scores for instructors in the 19 sampled departments at Institution A (N=152). Case study departments are identified.
Figure 4. PIPS scores from instructors in the 40 sampled departments at Institution D (N=424). Where applicable, departments with similar classification as those selected for case study at Institution A are identified.
Figure 5. Mean department PIPS scores for 72 departments at the four sampled institutions, including standard error bars for each department.
Figure 6. Demographic group differences in PIPS factor scores for Instructor-Centered Practice and Student-Centered Practice, as generated by the 2-factor PIPS model. Note. GTAs = Graduate Teaching Assistants; STEM = Science, Technology, Engineering, and Mathematics. (a) Mean score significantly different than respective group ($p < .01$); (b) Mean score significantly different than respective group ($p < 1E-9$).
Figure 7. Academic rank differences in Instructor-Centered and Student-Centered Practice mean scores, as generated by the 2-factor PIPS model. Note. (a) Mean score significantly higher than the lowest scoring group ($p < .05$), (b) Mean score significantly higher than the 2 lowest scoring groups ($p < .05$); (c) Mean score significantly lower than the 2 highest scoring groups ($p < .05$), (d) Mean score significantly lower than the highest scoring group ($p < .05$).
Appendix

Postsecondary Instructional Practices Survey (PIPS)

INFORMATION
This survey was designed by researchers at Author’s University to collect self-reported teaching practices from individuals teaching at institutions of higher education. This version includes 6 additional questions used for the validation of the PIPS.

INSTRUCTIONS
The survey has 24 teaching practice items and 9 demographic questions. It should take about 10 minutes to complete.

Each teaching practice item is a statement that may represent your current teaching practice. As you proceed through the survey, please consider the statements as they apply to teaching your lowest level, largest enrollment undergraduate course taught in the last two years.

Please read each statement, and then indicate the degree to which the statement is descriptive of your teaching. There are no “right” or “wrong” answers. The purpose of the survey is to understand how you teach, not to evaluate your teaching.

0 - Not at all descriptive of my teaching
1 - Minimally descriptive of my teaching
2 - Somewhat descriptive of my teaching
3 - Mostly descriptive of my teaching
4 - Very descriptive of my teaching

I. Questions about the Course (optional - used in PIPS validation phase)

Directions. Please consider the lowest level, largest enrollment undergraduate course you are currently teaching or have taught in the last two years:

1. Enrollment:
   ____% Majors in your discipline
   ____% Majors in other disciplines

2. Is this a general education course? Yes / No / Not Applicable

3. Weekly contact hours you teach per section:
   Lecture:                      Discussion/Recitation:
   Lab:                         Other (please specify):
   Combined Lecture/Lab:

4. If you think we need more information about your class, please explain:
I. Questions about the Course (optional - used in PIPS validation phase)

Directions. Please consider the lowest level, largest enrollment undergraduate course you are currently teaching or have taught in the last two years:

5. How are most decisions about teaching practices made?

   ____ I make the decisions.
   ____ I’m part of a team that makes decisions.
   ____ Someone else makes the decisions.

   Describe if applicable:

6. If you teach lecture and/or integrated lab, please indicate what proportion class time during a typical week is spent in the following activities. The sum of these questions should equal 100%.

   The instructor talking to the whole class. ____ %
   Students working individually. ____ %
   Students working in small groups. ____ %
   Students doing something else. (please specify) ____ % Other Activity: ____________
   ____ % Other Activity: ____________
   ____ % Other Activity: ____________

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## II. Teaching Practice Statements
Please indicate the degree to which the following statements are descriptive of your teaching in your lowest level, largest enrollment undergraduate course taught in the last 2 years.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at all descriptive of my teaching</th>
<th>Minimally descriptive of my teaching</th>
<th>Somewhat descriptive of my teaching</th>
<th>Mostly descriptive of my teaching</th>
<th>Very descriptive of my teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>P01. I guide students through major topics as they listen and take notes.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P02. I design activities that connect course content to my students' lives and future work.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P03. My syllabus contains the specific topics that will be covered in every class session.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P04. I provide students with immediate feedback on their work during class (e.g., student response systems, short quizzes)</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P05. I structure my course with the assumption that most of the students have little useful knowledge of the topics.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P06. I use student assessment results to guide the direction of my instruction during the semester.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P07. I frequently ask students to respond to questions during class time.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P08. I use student questions and comments to determine the focus and direction of classroom discussion.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P09. I have students use a variety of means (models, drawings, graphs, symbols, simulations, etc.) to represent phenomena.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
II. Teaching Practice Statements
Please indicate the degree to which the following statements are descriptive of your teaching in your lowest level, largest enrollment undergraduate course taught in the last 2 years.

<table>
<thead>
<tr>
<th>Statement</th>
<th>Not at all descriptive of my teaching</th>
<th>Minimally descriptive of my teaching</th>
<th>Somewhat descriptive of my teaching</th>
<th>Mostly descriptive of my teaching</th>
<th>Very descriptive of my teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>P10. I structure class so that students explore or discuss their understanding of new concepts before formal instruction.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P11. My class sessions are structured to give students a good set of notes.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P12. I structure class so that students regularly talk with one another about course concepts.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P13. I structure class so that students constructively criticize one another’s ideas.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P14. I structure class so that students discuss the difficulties they have with this subject with other students.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P15. I require students to work together in small groups.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P16. I structure problems so that students consider multiple approaches to finding a solution.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P17. I provide time for students to reflect about the processes they use to solve problems.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P18. I give students frequent assignments worth a small portion of their grade.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
II. Teaching Practice Statements

Please indicate the degree to which the following statements are descriptive of your teaching in your *lowest level, largest enrollment undergraduate course taught in the last 2 years*.

<table>
<thead>
<tr>
<th></th>
<th>Not at all descriptive of my teaching</th>
<th>Minimally descriptive of my teaching</th>
<th>Somewhat descriptive of my teaching</th>
<th>Mostly descriptive of my teaching</th>
<th>Very descriptive of my teaching</th>
</tr>
</thead>
<tbody>
<tr>
<td>P19. I require students to make connections between related ideas or concepts when completing assignments.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P20. I provide feedback on student assignments without assigning a formal grade.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P21. My test questions focus on important facts and definitions from the course.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P22. My test questions require students to apply course concepts to unfamiliar situations.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P23. My test questions contain well-defined problems with one correct solution.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
<tr>
<td>P24. I adjust student scores (e.g. curve) when necessary to reflect a proper distribution of grades.</td>
<td>0</td>
<td>1</td>
<td>2</td>
<td>3</td>
<td>4</td>
</tr>
</tbody>
</table>
III. Demographic Questions

1a. Please indicate your academic rank.
   ___ Professor
   ___ Associate Professor
   ___ Assistant Professor
   ___ Full Time Lecturer / Instructor
   ___ Visiting Professor
   ___ Adjunct or Part-time Instructor
   ___ Graduate Student Instructor
   ___ Other (please specify): ___________________

1b. If applicable, what is your role as a graduate student instructor?
   ___ Instructor for a stand-alone course
   ___ Instructor for a lab or discussion section associated with another course
   ___ Grader
   ___ Other (please specify): ___________________

2. Please indicate your academic department. You may provide more than one department should you teach and/or have an appointment in more than one department.

3. What is your gender?
   ___ Female
   ___ Male
   ___ Prefer not to respond

4. Please identify the racial or ethnic group with which you most identify.
   ___ Asian
   ___ Black
   ___ Hispanic or Latino/a
   ___ Native American or Alaskan Native
   ___ Native Hawaiian or Pacific Islander
   ___ White
   ___ Multi-ethnic
   ___ Other
   ___ Prefer not to respond
5. What is your tenure status?
   ___ Tenured
   ___ Untenured, but on tenure track
   ___ Untenured, not on tenure track

6. How many years have you been teaching in higher education?

7. How many years have you been teaching at your current institution?

8. What proportion of your job duties is related to teaching?

9. What leadership role, if any, do you have in your department?
   ___ I do not have a leadership role.
   ___ I am the Chair/Head of the department.
   ___ I am the Associate Chair/Associate Head of the department.
   ___ I am the Chair of the Curriculum Committee in the department.
   ___ I have another leadership role in the department. Please specify: ______________