

Practice What You Preach: Instructors As Transformational Leaders In Higher Education Classrooms

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ABSTRACT

Instructor-leadership can be defined as the process by which teachers direct classroom activities so as to influence students' engagement and achievement. Instructor-leadership in higher education research has focused on the dominant theory of transformational leadership. This paper proposes a context-sensitive measure of transformational leadership specifically adapted to the unique situation of instructors in higher-education institutions. Using a secondary dataset of over 2,700 students across the UK, the results of a principal component analysis and confirmatory factor analysis indicated three transformational instructor-leadership dimensions including consideration, intellectual stimulation, and path-to-goals. Each of the three dimensions was strongly related to a different learning outcome. An additional independent validation study confirmed the validity of the new measure vis-à-vis established context-independent measures and outcomes of transformational leadership. This paper extends research on both transformational leadership and transformational instructor-leadership by highlighting the importance of using a context-specific approach, examining the impact of each leadership dimension separately, and investigating relationships to novel learning outcomes. Suggestions for future research and practical implications are discussed.

Keywords: Transformational leadership; transformational instructor-leadership; instructor-leadership; leadership; higher education; learning.

Traditionally, “service quality and higher education seemed about as compatible as oil and water” (Canic & McCarthy, 2000, p. 1). However, with changing socio-economic conditions, universities have become increasingly aware of their need to provide high quality

services to attract and retain students. If students are dissatisfied, enrolment figures fall and this, in turn, negatively influences funding and job security (Canic & McCarthy, 2000). What can be done to improve student service at higher education institutions (HEIs)? Past research highlights the important role of instructors in this regard. Students consider instructor's teaching ability, quality, and approachability to be some of the most important aspects of service surpassing the importance of other aspects of service such as layout and décor of lecture and tutorial facilities, recreational facilities, catering facilities and vending machines, availability of parking, textbook value and availability, and more (Douglas, Douglas, & Barnes, 2006).

The majority of research on improving instructor's teaching ability and quality in higher education has been offered in disciplines such as education, communication, and psychology. An alternative route of investigating instructor quality may also lie in the leadership literature via the concept of instructor-leadership (see for e.g., Baba & Ace, 1989; Bolkan & Goodboy, 2009; Dawson, Messe, & Phillips, 1972; Harvey, Royal, & Stout, 2003; Ojode, Walumbwa, & Kuchinke, 1999; Pounder, 2008; Walumbwa, Wu, & Ojode, 2004). We define instructor-leadership as the process by which teachers direct classroom activities so as to influence students' towards the achievement of some goal.

Recent studies on instructor-leadership focused on transformational leadership theory. A transformational leader can be defined as one who is able to increase their followers' awareness of group goals and help them to broaden and transcend their self-interest for the group's interests. These leaders are able to motivate and inspire followers to high levels of effort and performance (Bass, 1990; Yukl, 2009).

The foundations of transformational leadership theory have been developed by Bass (1990), who describes a transformational leader in terms of four dimensions. Firstly, charisma

usually describes behaviours that are unconventional, innovative, self-sacrificial, inspirational, and dynamic (Yukl, 2009). Secondly, inspirational motivation entails the communication of an appealing vision, providing challenging standards, talking with enthusiasm and optimism, and use of symbols to focus followers' efforts (Bass, 1990; Yukl, 2009). Thirdly, individualized consideration is the treatment of followers as unique individuals, giving specialized attention to their needs and lending support and encouragement (Bass, 1990; Yukl, 2009). Finally, intellectual stimulation describes leaders who challenge followers ways of thinking helping them to analyze various solutions and strategies as a means of tackling problems (Bass, 1990; Yukl, 2009).

Transformational leadership in the classroom shows promise. Like their business counterparts, transformational leaders in the classroom “must, among other things, be able to mobilize resources, mould their students, motivate them, and instil in them the commitment to a worthy cause” (Babbar, 1995, p. 37). A transformational instructor is expected to display enthusiasm and inspire students towards achieving high standards.

Studies have used Bass' transformational leadership dimensions to conceptualise and operationalise transformational instructor-leadership (TIL) (for e.g., Bolkan & Goodboy, 2009; Harvey et al., 2003; Ojode et al., 1999; Pounder, 2008; Walumbwa et al., 2004). While these studies found promising outcomes, such as improved students' effort, effectiveness, satisfaction, cognitive learning, and affective learning, they are marred by two fundamental flaws in research design.

First, almost all of these studies on TIL were conducted using an organizationally developed instrument called the Multifactor Leadership Questionnaire (MLQ). The usage of the MLQ in measuring TIL was seen as questionable because the classroom setting, while similar to

the organization setting, is not identical. The classroom can be regarded as a quasi-organization. That is, “it is possible to conceive the classroom as a small social organization with teacher as leader and students as followers” (Pounder, 2008, p. 118). The classroom setting is characterised by similar leadership dynamics to organizational settings in that both feature forms of communication, control, motivation, direction, and power differentials. There are also some key differences in the leader-follower dynamics between the classroom and the organization. Student-followers in a classroom setting may have (a) less frequent contact with their leader (b) advanced awareness of the relatively short-term length of their relationship with their leader (c) less accountability to their leader and (d) a greater sense of entitlement from their leader because they pay for the leader’s service. Due to these differences in leadership dynamics between the organization and the classroom, it is likely that the MLQ may not capture certain teacher-student interactions that are specific to the classroom context.

The second fundamental flaw is that Bass conceptualizes and operationalizes transformational leadership in terms of its effectiveness (van Knippenberg & Sitkin, 2013). Defining and measuring a concept in terms of its effects prevents us from studying its effects. Having elements of effects embedded into the MLQ constructs might also explain why they are highly correlated with each other and, thus, often summed to arrive at a single construct of transformational leadership. The use of this single construct or additive model is also problematic in that it does not coincide with the proposition that transformational leadership is comprised of conceptually distinct dimensions (van Knippenberg & Sitkin, 2013).

In addition to these two flaws, the MLQ has also been the subject of a number of general criticisms regarding its factor structure and its equivalence across cultures like the UK (see Edwards, Schyns, Gill, & Higgs, 2012; Tejada, Scandura, & Pillai, 2001). Overall, future

research on TIL should shift towards a more context-specific measure that considers the UK culture and does not include effects in its conceptualization and operationalization.

Two key studies in higher education pave the way for the development of a more context-specific measure of TIL. A study by Bolkan and Goodboy (2011) suggests likely connections between transformational leadership theory and communication behaviours that teachers display. Through the use of content analysis, their study revealed that TIL comprises of three dimensions including charisma, individualized consideration, and intellectual stimulation. Similarly, Baba and Ace (1989) showed that leadership dimensions such as structure and consideration can be implicitly measured by instruments not designed with the intention of measuring leadership but to provide feedback on instructor's teaching quality. Baba and Ace's approach suggests that these instructor-feedback measures may be able to capture unique context-specific leader behaviours which may be disregarded by more conventional leadership instruments.

Building on Bolkan and Goodboy's as well as Baba and Ace's work, the aim of this research is to provide a new and improved approach to conceptualizing and operationalizing TIL. This approach is better than existing approaches because it builds the measure of TIL from the ground-up, utilizing the contextual nature of classroom-feedback instruments to define leadership dimensions rather than tailoring organizationally developed instruments to the classroom. We use an impressive database to show how well the measure works in predicting novel learning outcomes. The new measure was then validated using a new sample.

STUDY 1: A PARSIMONIOUS MEASURE OF TRANSFORMATIONAL INSTRUCTOR-LEADERSHIP AND LEARNING OUTCOMES

An instrument based on students' evaluation of teaching should provide a superior means of operationalizing TIL in comparison to the use of established leadership instruments. This is so

because a classroom-based instrument is grounded in students' perceptions of the teaching-learning environment. Baba and Ace embrace the stance taken by Baird (1973) and assert that this "perceptual method is better than other techniques because it [relates] directly to students' classroom experiences, that is, teacher behaviour as it is received and interpreted by the student" (Baba & Ace, 1989, p. 511). Could this perceptual method uncover transformational leadership in the classroom?

Bolkan and Goodboy (2011) illustrated that many classroom specific instructor behaviours tend to mirror those proposed by three of Bass' transformational leadership dimensions. Charisma comprised of instructor behaviours such as teacher confirmation, nonverbal immediacy, humour, and content relevance; individualized consideration comprised of behaviours such as teacher availability, individualized feedback, verbal immediacy, personalized content, and conveying interest; and intellectual stimulation comprised of behaviours such as teaching style, challenging students, and independent thought. Classroom feedback instruments often capture such behaviours and, thus, should measure TIL. Therefore,

H1: Transformational leadership dimensions can emerge from teacher-evaluation questionnaires.

TIL is a relatively unexplored concept and transformational leadership researchers propose varying numbers of dimensions. These researchers are divided on the issue of whether the highly interrelated dimensions of transformational leadership should be examined as a single construct, or as individual dimensions. Given our earlier explanations of transformational leadership, each dimension is described by some distinguishable characteristic which establishes conceptual boundaries between the dimensions. Therefore, from a theoretical standpoint, combining the dimensions into a single construct simply because they are highly intercorrelated

is not a sound argument (van Knippenberg & Sitkin, 2013). Hence, we adopt the view of van Knippenberg and Sitkin (2013) that there is no theoretical basis for combining the dimensions of transformational leadership into a single construct.

H2: TIL comprises of more than one distinct dimension.

Building on this hypothesis, for each dimension to be distinct, there should not only be differences in the content being measured, but there should also be unique effects. With the exception of Harvey et al. (2003), all studies on TIL have examined how well a single construct of TIL predicts MLQ-measured outcome variables, e.g. effectiveness, extra effort, and satisfaction. Even though these outcomes are important in the classroom-context, they ignore the most fundamental outcome of HEIs – learning. The predictive validity of TIL was examined using three novel learning-oriented outcome variables including collegial support, deep approach to learning, and surface approach to learning.

Collegial support refers to the extent to which students receive friendly and timely assistance from their peers. TIL may promote collegial support in the classroom through the process of social learning. Social learning occurs when an individual learns by observing the behaviours of others (Bandura, 1977). Crossan et al. (2013) explains that students may develop their leadership character through the observation of their instructors' behaviours and relationships. Leadership behaviours that emphasize clear feedback, openness, support, and/or relationship building (e.g., consideration) are likely to influence their followers through modeling (Gardner, Avolio, Luthans, May, & Walumbwa, 2005). Therefore,

H3a: There is a positive relationship between supportive TIL behaviours and collegial support.

Students who use a deep approach try to genuinely understand the underlying meaning of the content through the use of active problem solving and deep thinking skills (Heikkilä & Lonka, 2006). Conversely, the surface approach involves rote learning for the purposes of memorization and recall, as well as other routine processing activities (Ferla, Valcke, & Schuyten, 2009; Heikkilä & Lonka, 2006). Marton and Saljo (1997, p. 43, original emphasis) contrast the two approaches by describing students as being either “*focused on the text in itself or on what the text was about; the author’s intention, the main point, the conclusion to be drawn*”. TIL behaviours that challenge students to engage with material, understand the relevance of what is being taught, and relate to the course’s content (e.g. intellectual stimulation) are likely to encourage students to learn the underlying meaning of the material. Similarly, such teaching methods should discourage students from relying on rote learning since memorization of material would not be very helpful in applying the material or achieving course goals. Hence,

H3b: There is a positive relationship between intellectually stimulating TIL behaviours and students’ adoption of a deep approach to learning.

H3c: There is a negative relationship between intellectually stimulating TIL behaviours and students’ adoption of a surface approach to learning.

METHODS

Data was gathered from a large-scale secondary dataset derived from the ‘Enhancing Teaching-Learning Environments in Undergraduate Courses’ (ETL) project (Hounsell & Entwistle, 2001).

Participants

The total sample for this study consisted of 2,707 students from five contrasting subject areas including Economics (n = 580, 21.4%), Media and Communications (n = 84, 3.1%),

Engineering (n = 414, 15.3%), History (n = 742, 27.4%), and Biological Sciences (n = 887, 32.8%). The subjects were selected due to the substantial student intakes in these areas and the diversity of the disciplines. The sample included 1,339 males (mean age of 1,331 males = 21 years) and 1,334 females (mean age of 1,328 females = 20 years). A key advantage of using this large dataset was that it provided a sample that was markedly larger and more representative of students across universities and disciplines than in previous studies on TIL, thus improving the generalizability of results. Additionally, the large sample allowed for split-sample validation by randomly splitting the sample into two halves.

Materials

The Experiences of Teaching and Learning Questionnaire (ETLQ) was specifically developed as part of the ETL project and was created by a research team comprising of staff from three universities including Edinburg, Coventry, and Durham. To create the questionnaire, the team triangulated information from literature reviews on general aspects of teaching and learning environments with interview feedback from both staff and small groups of students (Entwistle, 2005). For the ETLQ, items measuring students' feedback on teaching, approaches to learning, and collegial support are represented on a 5-point continuum (✓ = agree; ✓? = agree somewhat; ?? = unsure; ×? = disagree somewhat; ×× = disagree).

The ETLQ items were selected because many of the teaching items tapped into the concepts proposed by Bolkan and Goodboy (2011) as stated in the first research hypothesis. Students' feedback on teaching was measured 34 Likert items with higher scores indicating more positive evaluations of teaching for a particular course. Six teaching-related subscales were identified on the questionnaire cover page including (a) aims and congruence (5 items), (b) choice allowed (2 items), (c), teaching for understanding (5 items), (d) set work and feedback (5

items), (e) assessing understanding (2 items), (f) staff enthusiasm and support (2 items). These subscales closely resemble those used by McCune (2003) and, in her report, coefficient alphas were good (ranging from 0.73 to 0.84).

The learning outcomes were measured by 16 items in total. Deep approach was measured by 9 items with higher scores indicating more of a deep approach to learning, e.g., “In reading for this course, I’ve tried to find out for myself exactly what the author means” ($\alpha = 0.74$). Surface approach was measured by 4 items with higher scores indicating more of a surface approach to learning, e.g., “Much of what I’ve learned seems no more than lots of unrelated bits and pieces in my mind” ($\alpha = 0.67$). Collegial support was measured by 3 items with higher scores indicating greater collegial support. A sample item reads, “Students supported each other and tried to give help when it was needed” ($\alpha = 0.75$).

Procedures

Surveys were carried out in 17 university departments across Great Britain and were distributed to students at the end of a semester. The end of semester timing for data collection mimics that used by past studies on instructor-leadership. This timing ensured that students had sufficient familiarity with teachers and the learning environments created over the semester. To complement this approach, the study focused on teachers who were teaching units at the beginning and the end of a course. Data were collected anonymously.

RESULTS

After accounting for missing data and outliers, the total sample size was reduced from 2,707 to 2,704. The sample was randomly split into a test ($N = 1,361$) and validation sample ($N = 1,343$). Both the test and validation subsamples satisfied the statistical assumptions necessary

for PCA, including normality, homoscedasticity, linearity, and factorability of the correlation matrix.

Principal component analysis

Since the aim was to understand the underlying structure of a set of socially constructed variables, principal component analysis (PCA) was chosen as the most appropriate technique. Using the test sample, a PCA was conducted on 34 items with oblique rotation (Promax). Various tests were used to determine the number of factors to extract (including Kaiser's criterion, Velicer's Revised Minimum Average Partial (MAP) test, and Horn's parallel analysis). With no consensus between the tests, three-, four-, five-, and six-factor solutions were tested. A three-factor structure produced the clearest structure with stronger components than the other alternatives and was seen as theoretically similar to the structure proposed by Bolkan and Goodboy (2011). For the PCA, several re-specifications were conducted and 14 items were deleted in an iterative process due to poor representation by the factor structure.

The 20-item PCA was then validated using the holdout portion of the sample ($N = 1,343$) and one further item was removed because it cross-loaded on two factors (see Table 1). Overall, the validation sample showed very good support for the factor structure that was derived from the test sample.

INSERT TABLE 1 ABOUT HERE

The factors were named as follows:

- Factor 1. Consideration: The questions that loaded on this factor relate to constructive feedback and support given on assessments; staff's support in teaching including patience and helping students to think; valuing students' views; and sharing enthusiasm with students.

Factor 2. Path-to-Goals: The questions on this factor relate to the exposition of clear learning goals and the teaching of topics in a sensible and organized manner so as to accomplish these goals. Clarifying the path to learning goals involve the use of examples and provision of handouts and other materials.

Factor 3. Intellectual Stimulation: The questions that loaded on this factor contain some element of students being encouraged to think and be aware of varying evidence and issues in the subject matter. Students are also encouraged to not only apply their learning to the wider world, but also to challenge their understanding of subject aspects.

The items for each of the three factors clearly matched the descriptions of key aspects of transformational leadership, thus supporting H1. Confirmatory factor analysis (CFA) was subsequently used to confirm the derived 19-item three-factor solution. Using maximum likelihood in SPSS Amos, the measurement model was estimated for the total sample.

In using the CFA procedure, 3 items were dropped from the original 19 due to issues with their standardized residuals exceeding the threshold of $|4.0|$ (Hair, Black, Babin, & Anderson, 2009). Details of the final CFA are given in Table 1¹. All of the fit indices indicated good model fit ($\chi^2/df = 4.65$, RMR = .032, CFI = 0.97, TLI = 0.97, RMSEA = 0.037, GFI = 0.98, AGFI = 0.97, PCFI = 0.79). Chi-Square was 450.57 (df = 97) and significant ($p < .001$), which was to be expected given the large sample size and the known sensitivity of Chi-square to sample size (Kline, 2011). Due to the minor modifications, the final measurement model was not seen as a

¹ In assessing the measurement model, modifications were made for statistical and theoretical purposes. In examining the modification indices, four pairs of error terms were allowed to correlate based on the content of the questions, for e.g. pairs of items measuring feedback or goal clarity.

major departure from what was being tested, thus lending further support for H1. The model fit results for a measurement model comprising of a second-order construct were the same as the model comprising of three first-order constructs. Hence, there was partial support for H2 at this stage.

Construct, discriminant, and nomological validity

The results of the measurement model were used to evaluate construct, discriminant, and nomological validity. Firstly, construct validity was examined via standardized factor loadings, average variance extracted (AVE), and construct reliabilities (CR). All standardized factor loadings can be considered significant since they were all greater than 0.5 (Hair et al., 2009). The AVE values were considered acceptable for the purpose of developing a new instrument the lowest CR value was 0.73 (see Table 1). In terms of discriminant validity, Kline (2011) suggests that correlation estimates between constructs should not exceed 0.85. Here, the highest interconstruct correlation was 0.71. Therefore, using Kline's cutoff value, even though the constructs were related we can still discriminate between them adding further support for H2. The positive interconstruct correlations were also an indication of good nomological validity, i.e., suggesting that they all tap into different aspects of TIL.

Criterion validity

A path model was developed using a two-step process (Anderson & Gerbing, 1988). In the first step, the measurement model was estimated using the three TIL dimensions along with the three outcome variables. All fit indices indicated good model fit ($\chi^2/df = 4.01$, RMR = .038, CFI = 0.96, RMSEA = 0.033, GFI = 0.97, AGFI = 0.96). The measurement model was then transformed into a structural model to test hypotheses 3a, 3b, and 3c (see Figure 1). Structural relationships were imposed from consideration to collegial support and from intellectual

stimulation and path-to-goals to both deep and surface approaches to learning. While the model fitted well, two paths were not significant ($p > 0.05$). Path-to-goals and intellectual stimulation were not related to deep and surface approaches respectively and, thus, these two paths were removed. Following their removal, the results indicated good model fit and the fit indices were close to the measurement model's fit indices ($\chi^2/df = 4.13$; RMR = .04; CFI = 0.96; RMSEA = 0.034; GFI = 0.97; AGFI = 0.96; $\Delta\chi^2[9] = 67.79$, $p < .001$; $\Delta NCI = .01$; $\Delta CFI = .003$). These results support H2 and H3a and partially support H3b and H3c.

INSERT FIGURE 1 ABOUT HERE

Common method bias

To examine the potential effects of common method bias on the three TIL dimensions, we used the comprehensive CFA marker technique analysis plan proposed by Williams, Hartman, and Cavazotte (2010). For this approach, a marker variable is chosen and this variable must be theoretically unrelated to any of the other latent variables in the analysis. With an appropriate marker variable, a series of five nested CFA models are then tested. The first model is the CFA model in which all latent variables, including the marker variable, are allowed to correlate. The second model is called the Baseline Model and, for this model, the marker variable is orthogonal to the other latent variables and its factor loadings and error variances are fixed according to the data from the CFA model. The third model, referred to as the Method-C model, is similar to the Baseline Model but adds equally constrained factor loadings from the marker variable to each of the indicator variables in the model. The fourth model is called the Method-U model and is similar to the Method-C model, except that the additional factor loadings are now unconstrained. Finally, the fifth model, referred to as the Method-R model uses the better fitting model between Method-C and Method-U, and restricts the factor correlations to the values obtained from the Baseline Model.

The marker variable chosen for this analysis was ‘perceived importance of the subject to students’ because this variable should theoretically be unrelated to the other latent factors in the model². A comparison of the Baseline model to the Method-C model showed that the Baseline model was superior ($\Delta\chi^2[1, N = 1,944] = 1,735.98, p < .001$). Hence, there was no presence of method effects associated with the marker variable. The Method-U model was superior to the Method-C model ($\Delta\chi^2[15, N = 1,944] = 45.82, p < .001$) indicating that the restrictions in the Method-C model should be rejected. Finally, the Method-R model was not superior to the Method-U model ($\Delta\chi^2[3, N = 1,944] = 3.32, p = 0.34$) indicating that there was no biasing effects of the marker variable on the factor correlations. Thus, overall we found no evidence of common method bias.

DISCUSSION

The content of the TILQ items not only captured the theoretical descriptions of transformational leadership dimensions but also phrased the descriptions in ways that embrace classroom dynamics. The TILQ captured perceptions of teaching quality deemed to be of utmost importance to students, such as lecture coverage, instructor’s feedback on set work, and availability of materials (Banwet & Datta, 2003). For the three dimensions, there were some similarities and differences to Bolkan and Goodboy’s framework of instructor communication behaviours (Bolkan & Goodboy, 2011).

Similar to Bolkan and Goodboy’s work, TILQ’s consideration contained items that inferred caring, immediacy, availability, and conveying interest (Bolkan & Goodboy, 2011).

² Perceived importance of the subject was measured by three indicators in a questionnaire titled, the Learning and Studying Questionnaire (LSQ). The LSQ was distributed to the same students a few weeks prior to the ETLQ, near the beginning of the course. The number of students who answered both the LSQ and ETLQ was 1,944.

These four concepts are operationalized as patience in giving explanations, helping students to think and reach conclusions, quality of feedback, valuing students' views, and sharing of enthusiasm. The use of enthusiasm has previously been regarded as a facet of inspirational motivation, but sharing enthusiasm loaded on consideration in this study. This difference may signal a distinction between displaying and sharing enthusiasm, in which the former is associated with seducing followers towards a vision and the latter is seen as more supportive and follower-focused.

TILQ's intellectual stimulation dimension comprised of actions such as the encouragement of independent thinking and some insinuation of content relevance. Adding to Bolkan and Goodboy's work, behaviours such as teachers' encouraging students to contrast differing viewpoints, the discussion of 'behind the scenes' information in the subject area, application of subject knowledge to real-world issues, and being self-critical of one's own subject knowledge were also found to load on this construct.

TILQ's paths to goals dimension included content relevance, teacher clarity towards learning goals, the organization and execution of sensible topic sequencing and, resources given to assist students in understanding. This dimension represents some aspect of charisma as suggested by Bolkan and Goodboy (2011) in that sessions are aligned with learning goals. Even though the path-to-goals dimension is not distinctly represented in traditional models of transformational leadership, Robbins and Judge (2009) explain that "goals are another key mechanism that explains how transformational leadership works". This dimension is aptly described by Robbins in their quoting of Verisign's CEO, Stratton Sclavos sentiment which reads "It comes down to charting a course – having the ability to articulate ... where you're headed and how you're going to get there" (p. 454).

Each of the three dimensions was significantly related to one of the outcome variables. Consideration appears to promote the modeling of behaviours. That is, instructors ‘lead by example’ when they use positive behaviours such as valuing students’ views, showing interest, being transparent and open in the classroom and in evaluation, and focusing on development. Instructors who use intellectual stimulation to challenge students to apply the material to real situations and be critical of evidence encourages the students to focus on the underlying meaning of text. The use of such teaching does not shift students away from a surface approach but this might be because surface learning is sometimes necessary to develop understanding (Entwistle & Peterson, 2004). Finally, instructors’ use of path-to-goals behaviours discourage students’ adoption of a surface approach because such leader behaviours pave the way to achieving course goals, perhaps making it clear that memorization is not needed for goal achievement.

Overall, the 16-item questionnaire extracted from the 34 teaching items of the ETLQ appeared to be a good measure of three dimensions of TIL. Herein after, this 16-item questionnaire was referred to as the Transformational Instructor-Leadership Questionnaire (TILQ). The next step was then to evaluate the validity of the TILQ’s three dimensions with respect to established measures and outcomes of TIL respectively.

STUDY 2: VALIDATION OF THE TRANSFORMATIONAL INSTRUCTOR-LEADERSHIP QUESTIONNAIRE

The aims of this study were to (1) check convergent and incremental validity by examining the association between the three constructs from the TILQ and constructs from established measures of transformational leadership and (2) determine predictive validity by establishing how well the TILQ predicts outcomes typically associated with TIL. To meet both aims, we utilized well established instruments from the literature.

The most widely used measure of transformational leadership is the Multi-factor Leadership Questionnaire (MLQ) (Avolio & Bass, 2004). The MLQ measures transformational, transactional, and laissez-faire leadership. Bass explains that transformational leadership comprises of four dimensions including charisma, inspirational motivation, intellectual stimulation, and individualized consideration. Some of the dimensions of the MLQ were expected to correlate with some of the dimensions in the TILQ. For instance, both instruments measure consideration and intellectual stimulation. The TILQ's path-to-goals dimension was not similar to any of the MLQ's dimensions, but the former contains some aspect of content relevance, which was reported by Bolkan and Goodboy (2011) as being part of charisma.

In response to mixed empirical results concerning the factor structure of Bass' dimensions, particularly with respect to discriminant validity (see Carless[a], 1998), Rafferty and Griffin proposed five subdimensions of transformational leadership including vision, inspirational communication, supportive leadership, intellectual stimulation, and personal recognition. Vision has been defined as "[t]he expression of an idealized picture of the future based around organization values" (Rafferty & Griffin, 2004, p. 332). Inspirational communication has been defined as "[t]he expression of positive and encouraging messages about the organization, and statements that build motivation and confidence" (Rafferty & Griffin, 2004, p. 332). Supportive leadership involves "[e]xpressing concern for followers and taking account of their individual needs" (Rafferty & Griffin, 2004, p. 333). Intellectual stimulation was defined as "[e]nhancing employees' interest in, and awareness of problems, and increasing their ability to think about problems in new ways" (Rafferty & Griffin, 2004, p. 333). Finally, personal recognition describes "[t]he provision of rewards such as praise and acknowledgement

for achievement of specified goals” (Rafferty & Griffin, 2004, p. 334). Rafferty and Griffin (2004) found that while the five subdimensions are correlated, they still represent distinct factors.

Some correlations between Rafferty and Griffin’s measure (RG) and the TILQ were expected. Firstly, correlation between the intellectual stimulation subscales are expected. Secondly, consideration and supportive leadership might be seen as similar concepts. Finally, path-to-goals shares some similarity to vision.

In using the MLQ, previous studies have reported that TIL positively influences students’ satisfaction, effort, and perceptions of instructor’s effectiveness (e.g., Harvey et al., 2003; Pounder, 2008; Walumbwa et al., 2004). A systematic review by Judge and Piccolo (2004) confirms that transformational leadership has a strong positive effect on these outcomes. Hence, these outcomes were used to test the predictive validity of the TILQ’s dimensions.

METHODS

Participants

The final sample for this study consisted of 148 students from a university located in the northern region of the United Kingdom. The students were from seven faculties including Science (n = 48, 32.4%); Social Sciences (n = 34, 23.0%); Arts and Humanities (n = 25, 16.9%); Engineering (n = 20, 13.5%); Medicine, Dentistry, and Health (n = 19, 12.8%); and a learning institute (n = 2, 1.4%). This nonrandom sample included 51 males (mean age = 21 years) and 97 females (mean age = 21 years).

Materials

Preceding the leadership questionnaires, brief instructions were given to participants asking them to choose an undergraduate course in which one lecturer taught at least half of the modules for a course and to answer the upcoming questions based on that lecturer.

The Transformational Instructor-Leadership Questionnaire (TILQ). Sixteen items were represented on a 5-point Likert scale as described in the previous study. The inventory comprised of three subscales including (a) Path-to-goals (6 items) ($\alpha = 0.86$); (b) Consideration (6 items) ($\alpha = 0.84$); and (c) Intellectual stimulation (4 items) ($\alpha = 0.73$).

The Multi-factor Leadership Questionnaire (MLQ). The portion of the MLQ measuring transformational leadership consisted of 36 items that are represented on a 5-point continuum (0 = not at all; 1 = once in a while; 2 = sometimes; 3 = fairly often; 4 = frequently, if not always) with higher scores indicating higher TIL. The MLQ items were adapted to the classroom context using Pounder's word modifications (Pounder, 2008). Nine subscales were described for the inventory including (a) Idealized influence (behaviour) (4 items, e.g., "He/She will talk about his/her personal beliefs and value systems while teaching") ($\alpha = 0.60$); (b) Idealized influence (attributed) (4 items, e.g., "He/She is not only concerned about his/her own interests, but is genuinely concerned about the progress made by students") ($\alpha = 0.84$); (c) Intellectual stimulation (4 items, e.g., "He/She listens to different opinions for solving problems arising from the course") ($\alpha = 0.76$); (d) Individual consideration (4 items, e.g., "He/She is willing to provide help outside of class") ($\alpha = 0.82$); (e) Inspirational motivation (4 items, e.g., "He/She talks optimistically about the future") ($\alpha = 0.78$); (f) Management by Exception (passive) (4 items) ($\alpha = 0.44$); (g) Management by Exception (active) (4 items) ($\alpha = 0.73$); (h) Contingent reward (4 items) ($\alpha = 0.72$); and (i) Laissez-faire leadership (4 items) ($\alpha = 0.60$).

Rafferty and Griffin's scale (RG). The inventory consisted of 15 Likert items that are represented on a 5-point continuum (1 = strongly disagree; 2 = disagree somewhat; 3 = undecided; 4 = agree somewhat; 5 = strongly agree) with higher scores indicating higher TIL. The wording of the original items was modified to suit the classroom context by using changes

from Harvey et al. (2003). These changes included the target to lecturer, the context to class or school, and ‘employees’ or ‘people’ to ‘students’ where relevant. The inventory contained five subscales each containing three items including (a) Vision (e.g., “The lecturer has a clear understanding of where the class is going”) ($\alpha = 0.87$); (b) Inspirational Communication (e.g., “The lecturer says positive things about the class”) ($\alpha = 0.80$); (c) Intellectual Stimulation (e.g., “The lecturer challenges me to think about old problems in new ways”) ($\alpha = 0.78$); (d) Supportive Leadership (e.g., “The lecturer sees that the interests of students are given due consideration”) ($\alpha = 0.83$); and (e) Personal Recognition (e.g., “The lecturer commends me when I do better than average work”) ($\alpha = 0.90$).

Effectiveness, extra effort, and satisfaction. The MLQ included nine items which measure outcomes typically associated with transformational leadership. All nine items are represented on a 5-point continuum (0 = not at all; 1 = once in a while; 2 = sometimes; 3 = fairly often; 4 = frequently, if not always) with higher scores indicating more positive outcomes. The outcomes included (a) perceived effectiveness of the instructor (4 items) ($\alpha = 0.89$); (b) extent to which instructor is able to motivate students to give extra effort (3 items) ($\alpha = 0.90$); and (c) satisfaction with instructor (2 items) ($\alpha = 0.82$).

Academic achievement. Academic achievement was measured by three items which were averaged to create a composite score because the mean yielded nearly identical results to standardized z-scores and makes for easier interpretation. The first item reads, “How well are you doing in the course as a whole? Please try to rate yourself objectively, based on any marks, grades, or comments you have been given” and is represented on a 7-point Likert scale (Very well; Quite well; Well; About average; Not so well; Badly; Rather badly). The second item reads, “What final grade do you expect to receive in this course?” and is represented on a 7-point

continuum (70-100; 60-69; 50-59; 45-49; 40-44; 0-39; No grade). The third item reads, “How would you rate your expected academic performance (or how you have performed so far) in this course in comparison with fellow students?” and is represented on a 5-point Likert scale (Much better; better; The same; Worse; Much worse). Academic achievement had a Cronbach’s alpha value of 0.80.

Demographic. The questionnaire was preceded by questions asking about participants’ background information including age, gender, nationality, and year of study.

Procedures

Like all studies on instructor-leadership, the questionnaire distribution took place near the end of the semester. Before distributing the questionnaire, a small pilot study was conducted to verify question wordings and no problems were identified. For the final study, an email was initially sent to undergraduates at the Management School and then re-circulated to all undergraduates in order to increase sample size. The email contained a description of the benefits for taking part in the study – each participant received a personality evaluation and was entered into a £25 prize voucher draw; an information sheet assuring confidentiality and anonymity of responses; and a link to the online questionnaire. The data was exported into SPSS for analysis.

RESULTS

After accounting for missing data, the sample size was reduced from 148 to 139. Statistical assumptions were checked for the 21 composite variables since these variables were used in the final analysis.

Statistical assumptions

The assumptions of normality, homoscedasticity, and linearity were examined. Overall, there were issues with 10 of the variables in meeting the assumption of normality and 4 in

meeting the assumption of homoscedasticity. Non-normality and heteroscedasticity were addressed using the appropriate data transformations proposed by Tabachnick and Fidell (2005) and Hair et al. (2009). The recommended data transformations including squared, cubed, reciprocal, and square root helped to improve the variables in terms of meeting these assumptions. Hereafter, the 14 variables were used in their transformed form.

Correlation analysis

Table 2 shows the table of correlations for all of the leadership variables as well as the outcome variables. The correlations were calculated using Pearson's correlation coefficient. For the TIL dimensions, intellectual stimulation and path-to-goals were significantly correlated with all of the variables in the analysis. Consideration was significantly correlated with all of the variables except academic performance.

INSERT TABLE 2 ABOUT HERE

Multiple regression analyses

Four multiple regression models were estimated, one for each of the outcome variables. The independent variables entered included age, gender, and the three TIL variables. The results of these models are shown in Table 3. After conducting the regression analyses, the variate for each regression was evaluated and the assumptions of linearity, homoscedasticity, and normality were met. Also, there were no issues with multicollinearity as indicated by the variance inflation factor (VIF) and tolerance statistics.

INSERT TABLE 3 ABOUT HERE

For the first three regression models, the outcomes of effectiveness, satisfaction, and extra effort were entered as dependent variables. For each of these models, neither age nor gender was a significant predictor. Consideration was a relatively strong predictor in all three models. Intellectual stimulation was a significant predictor of effectiveness and extra effort, but

not satisfaction. Path-to-goals was a significant predictor of effectiveness and satisfaction, but not extra effort. Overall, the predictive power of each of the three models was moderate as indicated by their R^2 values. For the final regression model, academic performance was entered as the dependent variable. Here, intellectual stimulation and gender were significant predictors.

Hierarchical multiple regression analysis

Eight hierarchical multiple regression models were estimated, four for the MLQ and TILQ and four for RG and the TILQ (see Table 4). For each model, the variate's assumptions were met and multicollinearity was not problematic. For these hierarchical models, the demographic variables were entered in the first step, followed by the established instrument, and then the TILQ.

INSERT TABLE 4 ABOUT HERE

The incremental validity results showed that the TILQ captured unique information not explained by MLQ and RG leadership dimensions in predicting effectiveness, satisfaction, and academic performance. However, for effectiveness, TILQ's consideration did not significantly improve the prediction above the MLQ and RG measures.

For the MLQ and TILQ model, TILQ's consideration significantly predicted effectiveness and academic performance whereas MLQ's individualized consideration was not significant in these models. Interestingly, TILQ's consideration was a significant predictor of academic performance but this relationship was unexpectedly negative. TILQ's consideration was also a significant predictor of satisfaction even when MLQ's individualized consideration was significant. Similarly, TILQ's intellectual stimulation was a significant predictor of academic performance even when MLQ's intellectual stimulation was significant.

For the RG and TILQ model, TILQ's consideration and path-to-goals explained additional variance above RG's supportive leadership and vision in predicting effectiveness.

Here, the TILQ leadership variables accounted for 0.19 times more variance in the total R^2 associated with effectiveness. This extra variance was noteworthy given the similarities between consideration and supportive leadership as well as path-to-goals and vision. Similarly, in predicting satisfaction, TILQ's consideration explained 0.17 times more variance in the total R^2 than RG's supportive leadership. For academic performance, TILQ's path-to-goals and consideration explained 0.38 times more variance in the total R^2 than RG's intellectual stimulation. Again, consideration negatively predicted academic performance.

DISCUSSION

Convergent and predictive validity

There was very good agreement between the TILQ, MLQ, and RG in terms of their transformational leadership subscales. As expected, TILQ's consideration was moderately correlated with MLQ's individualized consideration and RG's supportive leadership and personal recognition. Surprisingly, TILQ's consideration was also moderately correlated with MLQ's idealized influence (attributed) and contingent reward as well as RG's inspirational communication. These latter correlations may be due to the concepts overlapping in describing the creation of a positive classroom atmosphere through the use of constructive feedback and sharing of enthusiasm. TILQ's intellectual stimulation was moderately correlated with both MLQ's and RG's intellectual stimulation. Finally, as expected, path-to-goals was moderately correlated with vision, but the correlation was not very high since path-to-goals adds more to the vision concept by including items measuring the extent to which leaders charter the path towards the vision. In chartering this path, the MLQ correlations indicate that both goal accomplishment (e.g., intellectual stimulation) and goal enticement (e.g., idealized influence, inspirational motivation) behaviours might be used.

The MLQ also measures laissez-faire and management by exception (passive), both of which can be considered to be unsupportive leadership or the lack of leadership. As expected, there were significant negative correlations between each of the TILQ's dimensions and the two unsupportive leadership variables.

For each of the outcomes measured by the MLQ, at least two of the TILQ's dimensions were significant predictors (see Table 3). Of the three TIL dimensions, consideration was the strongest predictor in all three models. According to Harvey et al. (2003), consideration predicts student involvement variables like satisfaction and extra effort because such leadership behaviour induces a sense of psychological safety. Consideration was also a strong predictor of perceived instructor's effectiveness even though this relationship was not significant in Harvey et al. (2003). The significance in this research may be because, in comparison to the MLQ, TILQ's consideration includes more classroom-relevant items such as instructor's feedback and patience in dealing with students.

Intellectual stimulation predicted effectiveness and extra effort. This relationship was expected because students from HEIs are "likely to have expectations of an enriched learning environment wherein the instructor challenges them intellectually" (Harvey et al., 2003, p. 400).

Path-to-goals predicted satisfaction and effectiveness but this dimension was a very weak predictor in both models. This was surprising given that path-to-goals was conceptually and empirically related to RG's vision and, in a separate analysis, vision was a relatively strong predictor of satisfaction ($\beta = 0.28, p < 0.01$) and effectiveness ($\beta = 0.29, p < 0.01$).

Academic performance was significantly predicted by gender, age, and intellectual stimulation. Of the three, intellectual stimulation was the strongest predictor. This dimension

should be related to academic performance because intellectually stimulating instructors encourage students to think and challenge them in the learning process.

Incremental validity

The evidence of incremental validity shows that the TILQ's classroom-developed constructs contribute additional predictive power beyond the standard organizationally-developed constructs. Furthermore, from the incremental validity tests, two interesting points were noted. First, there was the unexpected predictive power of idealized influence (attributed) in explaining the MLQ outcomes. This result signals a potential shortcoming of the TILQ in that it does not measure a dimension such as idealized influence or inspirational motivation which focus on attracting followers to the leaders' vision. Second, even though TILQ's consideration was not a significant predictor of academic performance in our regression analyses, it was a significant and negative predictor of academic performance in the hierarchical models that control for the MLQ and RG leadership variables. Given that consideration was related to collegial support, satisfaction, and perceptions of instructor effectiveness, it follows that consideration might encourage a 'dependency syndrome'. Closer examination of the consideration items support this view indicating that students might become dependent upon instructor and classmates for feedback, support, and encouragement. Perhaps, when students become dependent on these external support pillars, which are absent in exam conditions, poorer academic performance is the result. More research is needed here given that this is the first study to examine the relationship to student achievement and the relationship was only apparent in the hierarchical models.

In summary, the TILQ's dimensions had good convergent, predictive, and incremental validity. The instrument offers a psychometrically sound and context-specific measure for three dimensions of TIL.

IMPLICATIONS FOR RESEARCH AND PRACTICE

Future research

The TILQ may be expanded to include other transformational leadership dimensions. Charisma was strongly related to effectiveness, satisfaction, and extra effort and this dimension may capture aspects of TIL not included in the TILQ. Other potential TIL dimensions were inferred by items which were deleted in the derivation of the three-factor model. More specifically, the ETLQ contained items describing level of challenge and empowerment which are both associated with transformational leadership. These two dimensions were components in a six-factor structure, but they were underrepresented with each containing two items with significant loadings. Interestingly, level of challenge has been previously associated with intellectual stimulation (Bolkan & Goodboy, 2011), but the analysis showed that this construct may be better represented as a distinct dimension of TIL. The empowerment dimension has been represented as a significant part of the enabling dimension of transformational leadership as reported by Alimo-Metcalfe and Alban-Metcalfe (2005). These dimensions of TIL could be developed in future work.

Future research should also consider refining and further developing the three dimensions of the TILQ. The three constructs may be strengthened by adding unique items, for example, the path-to-goals dimension might be improved by incorporating elements of RG's vision dimension or MLQ's charisma. Also, existing items might be modified based on further psychometric evaluation or input from teacher-feedback or transformational leadership instruments. For

instance, even though many of the items specify teaching actions a few them might be improved by removing some of the potentially outcome-oriented connotations.

The three dimensions of the TILQ should be examined individually in future research. While the constructs were related and a higher-order construct showed very good model fit, there was evidence of discriminant validity. The correlations between the TILQ's subscales were less than Kline's cut-off point and were markedly lower than those between the MLQ's subscales. Similar to the results of Harvey et al. (2003), the results from the structural equation model and regression analyses also support this view of distinct dimensions by showing that there are differing effects of each dimension on deep and surface approaches to learning, collegial support, satisfaction, effort, effectiveness, and academic performance. Therefore, use of a single factor representing 'good teaching' can sometimes mask the impact of specific aspects of such teaching (Lizzio, Wilson, & Simons, 2002).

To date, all research examining the impact of TIL has been correlational. The next logical step would be to examine the mechanisms through which these leaders influence students' outcomes. These studies should also examine classroom relevant outcomes not considered before in TIL research, for e.g., students' attention or emotions.

Practical implications

In response to Pearce and Huang's call for more useable knowledge in management research (Pearce & Huang, 2012), the *Academy of Management, Learning and Education Journal, Volume 10, Issue 3*, gives some valuable insights into teaching leadership. The sample exercise offered by Schyns et al. (2011) can act as a first step in increasing instructors' awareness of the differences between their images of leadership and the students images of

leadership. Such an exercise could help change cognition which makes for easier changes in motivation and behaviour (Schyns et al., 2011).

For behavioural training, it is often unrealistic to expect that all instructors can adopt the varied number of behaviours and methods which are often proposed in educational research. A reality that has to be faced is the teaching staff's breadth of their repertoire of teaching methods (Bourner, 1997). According to Bourner (1997), "[i]f the teaching repertoire of academic staff is limited to only a few of the methods then that is the real choice available to us" (p. 348). Hence, educational research which advocates training programmes geared towards development of a myriad of behaviours and methods may not only be impractical but may represent a wastage of resources. Instead of this scattershot approach, what is needed is for performance feedback to feed directly into training and development.

For performance feedback, most HEs use some form of teaching evaluation instrument. It is likely that some items in these instruments may be similar to those of the TILQ. Hence, inclusion of the TILQ in these evaluation instruments may mean adding only a few items while making subtle changes to others. These instruments may also include measures of student outcomes such as satisfaction or perceived effectiveness of instructor. Data derived from these feedback instruments can be used to train instructors to develop TIL behaviours according to their performance gaps. For e.g., if students' satisfaction is low for a given course, the instructor can be trained to develop consideration. Alternatively, for disciplines like management in particular, if students are showing a lack of a deep approach to learning for a particular course, the instructor should use more intellectual stimulation. The transformational leadership perspective classified the numerous behaviours from education research into a simple classification of three behaviours, which can then be translated into three modules. Instructors

may be required to attend one or two modules depending on where their largest performance gap lies. This approach reduces the likelihood of stretching an instructor beyond their repertoire of teaching methods since each module covers similar conceptual behaviours.

For the three modules, leadership training techniques such as behaviour role modeling, case discussion, and/or simulations can be delivered through short term interventions or workshops (Yukl, 2009). Also, given the time pressures many instructors face, self-training through videos or interactive computer programs can be used as a substitute for formal training (Yukl, 2009). For e.g., a video on consideration might show an instructor using constructive feedback, patience in explaining things, and sharing enthusiasm. The video might even highlight the students' point of view showing how they model the instructors' behaviours, thus evolving from followers to leaders. The TILQ can be used to develop formal and informal training and, in comparison to the MLQ, is free to use with permission from the ESRC.

This paper paves the way for theoretical advancements and more usable knowledge on TIL. The practical implications given here cannot be drawn from causal conclusions. However, an impressive dataset along with rigorous methods allow for causal inferences to be made. These causal inferences are then translated into clear practical actions with a clear take-home message – as educators in management, we must practice what we preach and strive to be transformational leaders in our classrooms.

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Table 1

Factor Loadings and Communalities for Test and Validation Sample's Principal Component Analysis with Promax Rotation and Total Sample's Confirmatory Factor Analysis of Transformational Instructor-Leadership (Study 1)

Item descriptions	Principal component analysis								Confirmatory factor analysis			
	Test components				Validation components				Constructs			
	1	2	3	C	1	2	3	C	CO	PTG	IS	IR
The feedback given on my set work helped to clarify things I hadn't fully understood	.90			.62	.67			.50	.50			.25
The feedback given on my work helped me to improve my ways of learning and studying	.87			.60	.69			.54	.50			.25
Staff gave me the support I needed to help me complete the set work for this course unit	.82			.60	.66			.49	-			
I was encouraged to think about how best to tackle the set work	.57			.40	.50			.41	-			
Staff were patient in explaining things which seemed difficult to grasp	.50			.43	.78				.66			.44
Staff helped us to see how you are supposed to think and reach conclusions in this subject	.48			.48	.69			.57	.73			.54
Students' views were valued in this course unit	.46			.40	.71			.49	.66			.43
Staff tried to share their enthusiasm about the subject with us	.40			.38	.71			.50	.63			.40
It was clear to me what I was supposed to learn in this course unit		.88		.57		.79		.56		.55		.30
What we were taught seemed to match what we were supposed to learn		.81		.60		.74		.57		.71		.50
The topics seemed to follow each other in a way that made sense to me		.81		.54		.73		.52		.57		.32
The course unit was well organised and ran smoothly		.63		.46		.63		.48		.63		.40
How this unit was taught fitted in well with what we were supposed to learn		.59		.57		.60		.55		.75		.56
The handouts and other materials we were given helped me to understand the unit		.47		.36		.48		.35		.53		.28
Plenty of examples and illustrations were given to help us to grasp things better		.40		.38		.36		.36		-		
The teaching in this unit helped me to think about the evidence underpinning different views			.82	.61		.74	.61				.70	.50
This unit has given me a sense of what goes on 'behind the scenes' in this subject area			.77	.55		.77	.56				.61	.37
This unit encouraged me to relate what I learned to issues in the wider world			.76	.47		.71	.52				.57	.33
The teaching encouraged me to rethink my understanding of some aspects of the subject			.66	.47	.30	.46	.47				.63	.40
Variance extracted (%)									38.43	39.12	39.85	
Construct reliability									.79	.79	.73	

Note. Loadings less than .300 are not shown. C = communalities; PTG = Path-to-goals; CO = Consideration; IS = Intellectual stimulation; IR = Item reliabilities. Item reliabilities represent communalities and are calculated using squared factor loadings.

Table 2

Correlation Matrix for Leadership and Outcome Variables (Study 2)

	TILQ ConsiderationSq	TILQ IntStimSq	TILQ PathToGoalsCub	RGVision Cub	RGIntStimSq	RGInspComm	RGSuppLeadRecip	RGPersRecog	MLQHASq	MLQHIBSq	MLQIntStimSq	MLQ InspMot	MLQ IndConsid	MLQContReward	MLQLFtSqRt	MLQ MBEA	MLQ MBEP	MLQEffectiveSq	MLQSatisfactionSq	MLQExtEffort	AcadPerf Sq	Mean	SD
TILQConsiderationSq	1.00	.57**	.65**	.48**	.43**	.58**	-.46**	.45**	.62**	.45**	.64**	.60**	.63**	.64**	-.41**	.62**	-.24**	.69**	.64**	.58**	.14	15.65	5.91
TILQIntStimSq	.57**	1.00	.48**	.40**	.51**	.48**	-.30**	.29**	.45**	.46**	.55**	.46**	.34**	.44**	-.20**	.36**	-.29**	.54**	.48**	.48**	.27**	15.60	5.89
TILQPathToGoalsCub	.65**	.48**	1.00	.49**	.28**	.35**	-.41**	.30**	.59**	.33**	.55**	.51**	.53**	.48**	-.42**	.52**	-.29**	.60**	.55**	.46**	.20**	84.36	34.00
RGVisionCub	.48**	.40**	.49**	1.00	.46**	.41**	-.28**	.26**	.47**	.36**	.47**	.55**	.40**	.39**	-.38**	.44**	-.21**	.54**	.50**	.42**	.08	84.63	39.52
RGIntStimSq	.43**	.51**	.28**	.46**	1.00	.54**	-.32**	.33**	.45**	.47**	.60**	.52**	.43**	.55**	-.17**	.45**	-.11	.51**	.46**	.53**	.30**	13.32	6.16
RGInspComm	.58**	.48**	.35**	.41**	.54**	1.00	-.52**	.49**	.59**	.55**	.58**	.60**	.54**	.63**	-.30**	.53**	-.21**	.59**	.55**	.56**	.22**	3.43	.93
RGSuppLeadRecip	-.46**	-.30**	-.41**	-.28**	-.32**	-.52**	1.00	-.48**	-.53**	-.38**	-.44**	-.44**	-.53**	-.53**	.24**	-.55**	.08	-.49**	-.50**	-.43**	-.06	.35	.15
RGPersRecog	.45**	.29**	.30**	.26**	.33**	.49**	-.48**	1.00	.42**	.32**	.51**	.42**	.53**	.54**	-.31**	.53**	-.20**	.37**	.40**	.41**	.20**	3.20	1.13
MLQHASq	.62**	.45**	.59**	.47**	.45**	.59**	-.53**	.42**	1.00	.55**	.70**	.77**	.71**	.66**	-.43**	.64**	-.20**	.84**	.76**	.79**	.23**	8.67	4.69
MLQHIBSq	.45**	.46**	.33**	.36**	.47**	.55**	-.38**	.32**	.55**	1.00	.63**	.67**	.40**	.58**	-.07	.53**	-.07	.59**	.48**	.61**	.18**	6.17	3.96
MLQIntStimSq	.64**	.55**	.55**	.47**	.60**	.58**	-.44**	.51**	.70**	.63**	1.00	.71**	.74**	.73**	-.33**	.62**	-.20**	.71**	.66**	.72**	.34**	7.42	4.51
MLQInspMot	.60**	.46**	.51**	.55**	.52**	.60**	-.44**	.42**	.77**	.67**	.71**	1.00	.59**	.65**	-.29**	.63**	-.12	.77**	.64**	.74**	.27**	2.76	.90
MLQIndConsid	.63**	.34**	.53**	.40**	.43**	.54**	-.53**	.53**	.71**	.40**	.74**	.59**	1.00	.67**	-.39**	.61**	-.15	.65**	.69**	.65**	.21**	2.34	1.05
MLQContReward	.64**	.44**	.48**	.39**	.55**	.63**	-.53**	.54**	.66**	.58**	.73**	.65**	.67**	1.00	-.22**	.65**	-.16	.62**	.60**	.69**	.26**	2.28	.96
MLQLFSqRt	-.41**	-.20**	-.42**	-.38**	-.17**	-.30**	.24**	-.31**	-.43**	-.07	-.33**	-.29**	-.39**	-.22**	1.00	-.30**	.47**	-.47**	-.43**	-.25**	-.10	.83	.49
MLQMBEA	.62**	.36**	.52**	.44**	.45**	.53**	-.55**	.53**	.64**	.53**	.62**	.63**	.61**	.65**	-.30**	1.00	-.15	.66**	.59**	.62**	.18**	2.17	.94
MLQMBEP	-.24**	-.29**	-.29**	-.21**	-.11	-.21**	.08	-.20**	-.20**	-.07	-.20**	-.12	-.15	-.16	.47**	-.15	1.00	-.26**	-.24**	-.13	-.14	1.40	.71
MLQEffectiveSq	.69**	.54**	.60**	.54**	.51**	.59**	-.49**	.37**	.84**	.59**	.71**	.77**	.65**	.62**	-.47**	.66**	-.26**	1.00	.88**	.78**	.21**	9.62	5.00
MLQSatisfactionSq	.64**	.48**	.55**	.50**	.46**	.55**	-.50**	.40**	.76**	.48**	.66**	.64**	.69**	.60**	-.43**	.59**	-.24**	.88**	1.00	.76**	.22**	9.60	5.36
MLQExtEffort	.58**	.48**	.46**	.42**	.53**	.56**	-.43**	.41**	.79**	.61**	.72**	.74**	.65**	.69**	-.25**	.62**	-.13	.78**	.76**	1.00	.28**	2.50	1.19
AcadPerfSq	.14	.27**	.20**	.08	.30**	.22**	-.06	.20**	.23**	.18**	.34**	.27**	.21**	.26**	-.10	.18**	-.14	.21**	.22**	.28**	1.00	24.22	7.02

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

Table 3

Multiple Regression Analyses Predicting Effectiveness, Satisfaction, Extra Effort, and Academic Performance With TILQ Leadership Dimensions (Study 2)

Variables	Outcome Variables											
	Effectiveness			Satisfaction			Extra Effort			Academic Performance		
	B	SEB	β	B	SEB	β	B	SEB	β	B	SEB	β
Constant	-3.73	2.58		-3.80	2.99		-.20	.71		28.74	4.99	
Age ^a	51.03	49.07	0.06	45.51	56.87	0.05	10.29	13.56	.05	-173.69	94.81	-0.15
Gender	-0.13	0.62	-0.01	0.66	0.72	0.06	.03	.17	.01	-2.39*	1.20	-0.16
Consideration	0.37**	0.07	0.44	0.40**	0.08	0.45	.08**	.02	.40	-0.12	0.14	-0.10
Intellectual stimulation	0.15*	0.06	0.17	0.11	0.07	0.12	.04*	.02	.20	0.35**	0.12	0.30
Path-to-goals	0.03**	0.01	0.23	0.03*	0.01	0.20	.00	.00	.10	0.02	0.02	0.11
R ²		0.54		0.46				0.38			0.13	
F		31.10**		22.84**				16.03**			3.90**	

Note. N = 139.

a. Inverse of age was used to correct for skewness and kurtosis violations.

* $p < .05$. ** $p < .01$.

Table 4

Hierarchical Multiple Regression Analyses Predicting Effectiveness, Satisfaction, Extra Effort, and Academic Performance With MLQ and TILQ Leadership Dimensions as well as With RG and TILQ Leadership Dimensions (Study 2)

Model	Step	Variables	Outcome Variables							
			Effectiveness		Satisfaction		Extra Effort		Academic Performance	
			β	ΔR^2	β	ΔR^2	β	ΔR^2	β	ΔR^2
MLQ and TILQ	1	Age	-.01	.01	-.01	.00	-.032	.01	-.16*	.04*
		Gender	.00		.06		.012		-.16**	
TILQ	2	Idealized influence (A)	.48***	.75***	.45***	.64***	.43***	.70***	-.02	.12***
		Idealized influence (B)	.07		.02		.13*		-.06	
		Intellectual Stimulation	.04		.02		.15		.31**	
		Inspirational Motivation	.17**		.00		.16*		.14	
	3	Individualized Consideration	.01		.23**		.12		.02	
		Consideration	.15**	.03***	.14*	.02**	.01		-.27**	.04*
		Intellectual stimulation	.09		.10		.08		.22**	
		Path-to-goals	.04		.02		-.11*	.01	.03	
		Total R^2	.78***		.67***		.71***		.20***	
	RG and TILQ	1	Age	-.01	.01	-.01	.00	-.00	.00	-.17**
Gender			-.08		.01		-.03		-.15*	
2		Vision	.14**	.52***	.14*	.46***	.04	.44***	-.14	.13***
		Intellectual Stimulation	.12*		.10		.23***		.28***	
		Inspirational Communication	.20**		.14		.19**		.15	
		Supportive Leadership	-.14**		-.16**		-.07		.12	
3		Personal Recognition	-.06		.03		.08		.07	
		Consideration	.25***	.10***	.24**	.08***	.16	.04	-.21*	.05*
		Intellectual stimulation	.07		.04		.06		.18	
		Path-to-goals	.19**		.15		.11		.21*	
	Total R^2	.63***		.54***		.49***		.21***		

Note. N = 139.

* $p < .10$. ** $p < .05$. *** $p < .01$.

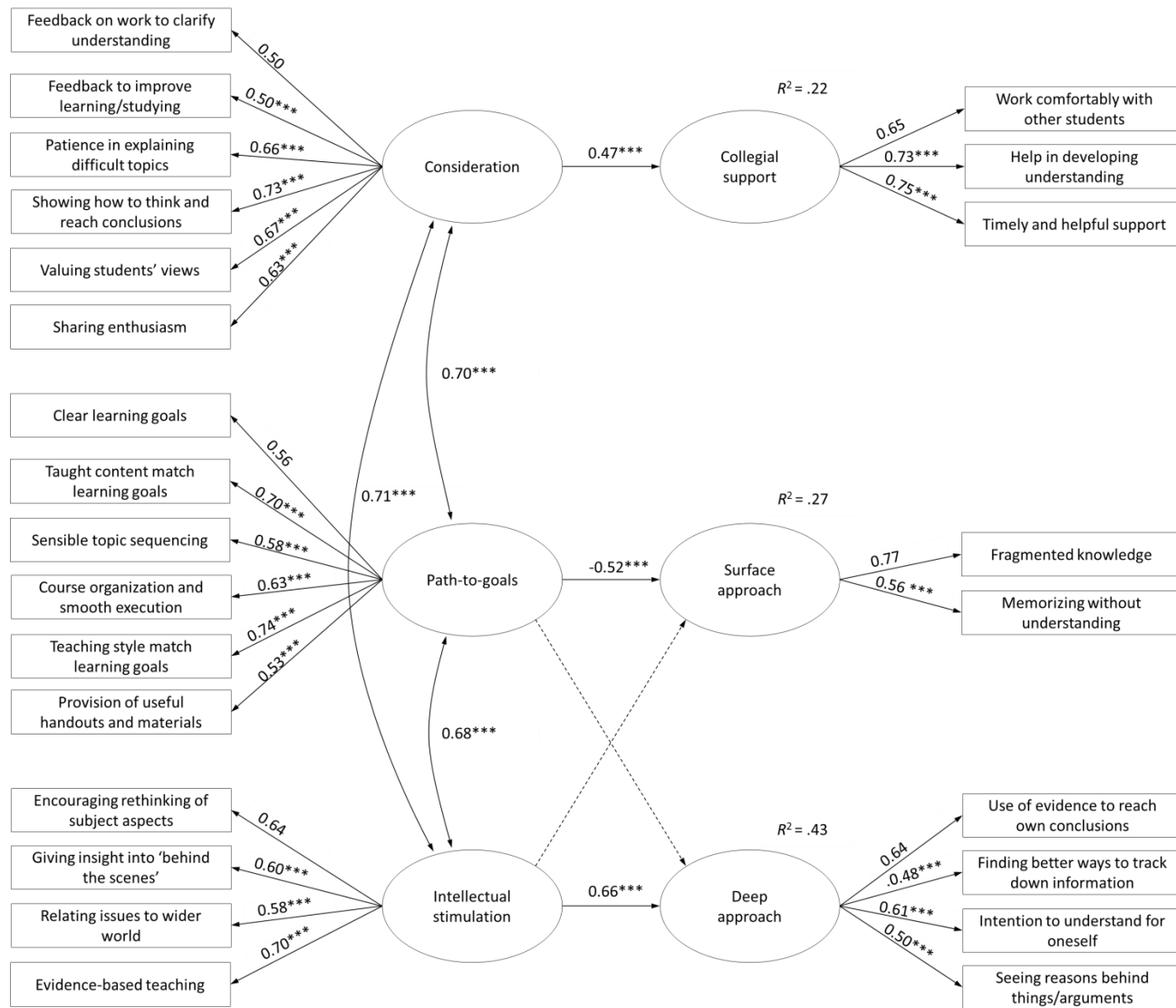


Figure 1. Multi-group partial metric invariance structural model of the relationship between transformational instructor-leadership as measured by the TILQ and learning outcomes. Standardized maximum likelihood parameter estimates. Error variances were excluded for ease in readability. Dashed lines indicate non-significant paths that were removed.

*** $p < .001$