

# The Effect of Transformational Leadership, Teachers' Openness to Experience and Gender on Innovative Work Behavior in Higher Education Institutions

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## Abstract

This study examined the effect of transformational leadership, openness to experience and gender on innovative work behavior in higher education institutions found in Amahara National Regional State. Among ten public universities, Bahir Dar, Gondar, Wollo, Debre Tabor and Debarke were selected using a lottery sampling technique. Using G\*power, from 1,726 teachers, 550 of them were selected as sample of the study. Data was collected through questionnaire and analyzed by structural equation modeling and Hayes PROCESS Macro. The results revealed that the positive influence of transformational leadership on innovative work behavior is mediated by openness to experience. The results also depicted that gender did not moderate the indirect effect of transformational leadership on innovative work behavior. Therefore, it can be concluded that the indirect effect of deans' transformational leadership on teachers' innovative work behavior is not conditional as a function of gender. This finding provides an empirically supported knowledge to explain how transformational leadership influences innovative work behavior in higher education contexts.

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## Introduction

In the ever challenging and competitive environment, innovative work behaviour among teachers is central in making higher educational institutions successful. Supporting this, researchers (e.g., De Jong & Den Hartog, 2010; George & Zhou, 2001; Janssen, 2000) noted that teachers' innovative work behaviour (IWB) has major impact on the development and application of educational innovations. West and Farr (1990) defined IWB as "the intentional introduction and

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application within a role, group or organization of ideas, processes, products or procedures” (p. 9). This implies that teachers who engaged in IWB can generate innovative pedagogies, services, processes or products to bring successful changes in the education system.

Thurlings, Evers, and Vermeulen (2014) argued that IWB is necessary to keep up with a rapidly changing environment. It is a prerequisite for future new technological teaching and research. They add that educational institutions act as sources for more innovative behaviours of other institutions to stay competitive. This suggests that teacher’s IWB is vital in capitalizing innovation which leads higher education systems to maintain their importance towards educational development and quality education.

Studies (Klaeijssen, Vermeulen, & Martens, 2018; Kundu & Roy, 2016; Park, Song, Yoon, & Kim, 2014) have proven that IWB is influenced by individual, demographic and organizational factors. In this regard, researchers (e.g., Carmeli, Meitar & Weisberg, 2006; Loogma, Kruusvall & Umarik, 2012; Messmann & Mulder, 2011) contributed useful insights into the individual, demographic or organizational determinants of teachers’ IWB. Thurlings et al. (2014) indicated that these factors were mostly studied separately and the interaction effect among them is still unexplored. In addition, Park et al. (2014) point out that while various antecedents of IWB have been studied, specific evidence on how individual, organizational and demographic factors influence IWB remains inconclusive and incomplete. Supporting this, Thurlings et al. (2014) in their meta-analysis confirm that no attempt so far has been made to conduct a study taking into account the variety of demographic, individual, and organizational factors related to teachers IWB. Although understanding these determinants of IWB is worthwhile, a study on explaining the interaction effects of these factors on IWB is necessary. Furthermore, as the best knowledge of the researchers, there is no research on the antecedents, specifically, the combined effects of transformational leadership, openness to experience and gender as determinants of teachers IWB in Ethiopian public higher education institutions (HEIs).

Transformational leadership (TL) is one of the most important organizational factors that influence teachers’ IWB (Jung, Chow, & Wu, 2003). Some studies found that TL has positive effect on teachers’ IWB (Berraies & Zine El Abidine, 2019); however, other studies revealed that TL does not have a significant direct effect on IWB (Jacobsen & Andersen, 2017). In this regard, Groves (2020) suggested that very little empirical research explains the mediating mechanisms through which TL style yields such pronounced influences and TL research is often criticized for failing to account for the moderating effects of other variables. This implies that many of the crucial questions of TL theory regarding the mediating role of openness to experience and the moderating role of gender lack empirical research evidence. This requires further investigations.

While TL is assumed to be practiced at different echelon of management in HEIs, the current research focused on the middle level management positions occupied by college deans. There are three arguments regarding the contributions of middle level management on innovation. The first argument is middle level managers lack sufficient potential. Supporters of this view reported that middle level managers cannot challenge the status quo rather they stick to the existing arrangements in the organization (Griffith, Baur & Buckley 2019; Hout, 1999); thereby become barriers to innovations (Koene, 2017). The proponents of the second view argued that middle level

managers are not necessary in organizational innovation. In this regard, Munteanu and Rațiu (2018) claimed that organizations require mentors rather than middle level managers; Sims (2003) concluded that middle managers are barriers to innovation. This may lead to less attention for middle managers in their contribution to innovation efforts (Hermkens & Romme, 2020)

On the contrary, the third view noted the importance of middle level managers by labelling them as bridge between top management and supervisory management (Hermkens et al. 2019) bringing important effect on innovation (Balogun 2003; Balogun & Johnson, 2004). Researches (Currie & Procter, 2005; Realin & Cataldo, 2011; Tabrizi, 2014) suggested that college deans, as middle level managers, play a decisive role on innovation by stimulating teachers to challenge their practices and search for new approaches to perform their duties. Similarly, Astin and Astin (2000) indicated that deans have important influences on the success of their college by creating a supportive environment where teachers can grow and thrive. Hermkens, Dolmans and Romme (2019) argued that deanship is the critical management position between university presidents and teachers. This position is instrumental in triggering the thinking and doing functions of management systemically (Hermkens & Romme, 2020). This suggests that deans may bridge the gap between teachers and presidents as they are required to be sources of innovation to remain competent in the global environment.

Although the significance of top-level managers in promoting innovation has been acknowledged (Chiaroni, Chiesa & Frattini, 2011; Zhao, Li & Yu, 2021), the fundamental role played by college deans in innovation process has been mostly ignored. In this regard, Conway and Monks (2011) noted that the central role played by middle level managers like college deans in innovation process is generally overlooked. In supporting this idea, Bekalu and Wossenu (2012) indicated that while deans' leadership is among the important factors for institutional success, there is little empirical study that measures deans' effectiveness in Ethiopia's HEIs.

The extent to which teachers engage in IWB is not only determined by their professional skills and knowledge, but also is impacted by their inclination to innovation and leadership support (Park et al. 2014; Yesil & Sozbilir, 2013). In order to understand more about the significance of these factors, as well as their interaction, this study takes a different position that having the objective of examining the extent to which teachers develop, promote, and implement new ideas to improve educational practices is crucial. In other words, it focuses on the impact of interaction aspects of TL, OE and gender on IWB.

Taking in to account the foregoing research gaps, the current study examined the effect of transformational leadership, openness to experience and gender on innovative work behaviour in public universities found in Amhara National Regional State. Accordingly, the following hypotheses were proposed.

- H1: Transformational leadership has a direct effect on teachers' innovative work behaviour.
- H2: Openness to experience mediates the effect of transformational leadership on teachers' innovative work behaviour.
- H3: Gender moderates the indirect effect of transformational leadership on innovative work behaviour through openness to experience with the mediation effect being stronger for males.

## **Transformational Leadership and Innovative Work Behaviour**

Among the many organizational factors, leadership is acknowledged as one of the most important factors that influence teachers' IWB (De Jong & Den Hartog, 2010; Ebrahimi, Moosavi and Chirani, 2016; Pundt, 2015). Similarly, Carmeli, Gelbard and Reiter-Palmon (2013) argued that innovation is more likely successful if educational leaders aggressively involve in the innovation process. Park et al. (2014) also demonstrated that if teachers' IWB are to be systematically stimulated, leadership that supports innovation is essential.

Bryman (2007) confirmed that there is little empirical research addressing the leadership styles associated with higher education. Black (2015) noted the inadequacy of the traditional leadership (e.g. transactional leadership) in higher education contexts. Aytaged (2014) suggested that such type of leadership styles in higher education face challenges due to the dynamic social, political, economic and technological changes. Aligning with Aytaged's argument, Amey (2006) and Astin and Astin (2000) noted that TL is needed to address HEIs challenges in the turbulent and competitive environments. Moreover, Buller (2015) argued that the most important task for leaders in higher education is to spend their time creating a culture of innovation. Burns (2013) concludes that TL is a relevant approach for higher education institutions in transforming them to their central mission.

Bass and Riggio (2006) also noted that TL tends to have more committed teachers as well as pay attention to teachers' personal development. Various researches (Aryee, Walumbwa, Zhou & Hartnell, 2012; Li, Zhao, & Begley, 2015; Shin & Zhou, 2003) demonstrated a positive relationship between TL and IWB. For example, studies conducted by Afsar and Masood (2017) and Pieterse et al. (2010) showed that TL has positive and statistically significant effect on IWB. Furthermore, research by Jung, Chow, and Wu (2003) confirmed that TL behaviours affect teacher's innovativeness. Researchers (Elkins & Keller, 2003; Shin & Zhou, 2003) argued that transformational leaders increase teachers' intrinsic motivation which in turn stimulates creativity and encourage teachers to think "outside of the box". These researchers further obtained that transformational leaders primarily encourage teachers' creativity by providing an environment that supports teachers' innovative efforts. This implies that in order to promote significant educational innovations in HEIs deans should demonstrate TL behaviours that inspire teachers to generate new ideas and products.

## **Openness to Experience as Mediator**

Though TL has positive effect on IWB, Afsar, Masood and Umrani (2019) argued that the way TL influences IWB has not been adequately researched and relatively little attention has been given to the mechanism of the relationship between TL and IWB (Kahai, Sosik, & Avolio, 2003). Similarly, researchers (Gong, Huang & Farth, 2009; Choi, Kim, Ullah & Kang, 2016) noted that explaining the underlying mechanism through which TL influences IWB is essential. This requires further study and the consideration of openness to experience (OE) as a mediator may explain the link between TL and IWB. This mediation effect denotes how IWB is influenced by TL through a causal sequence as a result of which TL influences OE which in turn influences IWB (Hayes, 2022).

OE is defined as the tendency of teachers to be creative, imaginative, curious, independent thinkers, unconventional, and thoughtful (Costa & McCrae, 1992). The success of educational innovations depends hugely on teachers' involvement to generate and realize innovations. However, teachers vary significantly from each other in terms of their willingness and potential to innovate (Hammond, Neff, Farr, Schwall, & Zhao, 2011). Therefore, studying individual differences is of great importance in order to understand individual behaviour towards innovation (Yesil, & Sozbilir, 2013).

Empirical research findings disclose that TL positively influences OE. For example, Zainab, Akbar and Siddiqui (2022) revealed that TL has positive effect on openness to change. Similarly, Yue, Men and Ferguson (2019) in their study "Bridging transformational leadership, transparent communication, and employee openness to change" show that TL was positively associated with OE. Furthermore, Groves (2020) illustrated a strong evidence for the positive and significant relationship between TL and OE.

In addition, various researchers explained the positive relationship between OE and IWB. Munir and Beh (2016) in their study on "Do personality traits matter in fostering innovative work behaviour" reveal that one of the big five personality factors, OE had a positive significant relationship with IWB. Similarly, Feist (1998) in his meta-analysis also illustrates that of the Five-Factor traits, OE has the strongest relationship with creativity and the results further show that teachers who are open to new experiences are more innovative. Studies (Coelho, Lages & Sousa, 2018; Hammond, et. al, 2011; Madrid, Patterson, Birdi, Leiva & Kausel, 2014; Niu, 2014; Patterson, Kerrin, & Gatto-Roissard, 2009) found that teacher's OE positively and significantly influences IWB. Feist's (2010) study also indicated that OE was the most consistent and stable predictor of IWB. Furthermore, Raja and Johns' (2010) work on "The effect of personality on creativity" revealed that OE was the only dimension with a significant effect on creativity.

Similarly, George and Zhou (2001) in their quantitative study on the relationship of openness to experience and conscientiousness to creative behaviour found that teachers who are high on OE possess a broader range and depth of experience, and more of an appreciation of the merits of new ways of doing things and the potential for improving and changing the status quo, than individuals who have low OE. In a similar vein Scott and Bruce (1994) obtained that teachers who are open-minded generate new ideas that may promote IWB.

From the mentioned empirical evidences, it is vividly seen that TL significantly influences OE. In addition, OE influences IWB. This implies that the effect of TL on IWB may be transmitted through OE. In other words, TL affects IWB because TL affects OE, and OE, in turn, affects IWB. The current researchers, therefore, assume that OE serves as a mediator in the relationship between deans' TL and teachers' IWB. As a result, In order to employ mediation analysis according to Baron and Kenny(1986), association between TL and IWB is not a sufficient condition. Researchers need two more conditions: 1) TL should predict OE without the inclusion of IWB in the model and 2) OE should predict IWB in the mediation model.

## Gender as Moderator

The issue of gender and innovation has been a hot agenda in modern organizations. Alsos, Hytti and Ljunggren (2013) revealed that the notion of gender recently gained attention among researchers in the area of innovation. While researchers suggest numerous contextual variables that moderate the effects of TL (Groves, 2020; Pieterse, Knippenberg, Schippers & Stam, 2010; Walumbwa, Lawler, Avolio, Wang, & Kan, 2005), no study explored the moderating effect of gender on the prediction of IWB by OE. In this study, gender functions not in a causal role, but as a moderator that influences the strength of the link between OE and IWB. When one is testing the relationship between OE and IWB in this moderated mediation study, it is vital to account for the moderating role of gender in the indirect effects of TL on IWB.

It is mentioned that of the big five dimensions of personality OE is most related to IWB. However, to get a better understanding of the relationship between OE and IWB, the current study considered gender as a boundary condition. Newnham (2016) pointed out that though there are female scientists, inventors, designers and artists that are contributing their share tackling some of the world's most complex problems through innovation, many studies found that male teachers are considered more innovative than their female counterparts. The studies of Dautzenberg, (2012) and Marlow & McAdam (2011) also confirmed that a strong association between maleness and innovation. Similarly, Bozeman and Gaughan (2007) and Panagiotis (2016) revealed that males are more effective innovators than females. This suggests that males are much more likely to be concerned about innovation.

The other issue, which has received little attention, is the extent to which gender serves as a moderator of the relationship between TL, OE, and IWB. Although studies have examined gender differences in innovation, further investigation of whether gender serves as a moderator would have practical significances. Costa, Terracciano and McCrae (2001) found that men as being more assertive and open to new ideas. On the contrary, Winstead, Derlega, and Unger (1999) noted that people characterized females as guided by emotion and concerned about how openness will be enhanced and use that openness to generate new ideas. These concerns may bring unwillingness to be open minded and participate in innovative activities. This suggest that the effect of OE on IWB is likely to weaken for females. In line with these evidences, the current researchers assume that the interaction effect of openness and gender influences the indirect effect of TL on IWB.

The study gives a novel contribution to innovation literature because no previous research has examined the effect of TL, OE and gender on IWB in the higher education contexts. Therefore, this study presents new insights into this field by integrating the study variables into one framework. In other words, the positive influence of leadership styles on teachers' innovative behavior could be subject to the development of teachers' quality of openness to new perspectives and challenges. In this sense, this study filled the knowledge gap through highlighting the link between TL and IWB and presented empirical evidence for policy makers and leaders to focus directly on nurturing teachers' openness to innovation in HEIs.

The result of this research will provide valuable information for policy makers and planners on how to promote teachers' IWB in HEIs. In addition, the results provide information to deans to

realize the significance of their leadership in innovation process. As a result, they will be encouraged to promote teachers' IWB in bringing successful changes in the education system.

This study has also delimitations. There are private and government higher education institutions in Ethiopia. But the study was delimited to public universities found in Amhara National Regional State. Although students, leaders, and other staff need to be part of the study, this study was delimited to teachers' perspective.

Based on the above empirical and theoretical descriptions, the researchers developed the following moderated mediation conceptual framework.

**Figure 1**

*Proposed Conceptual Framework*

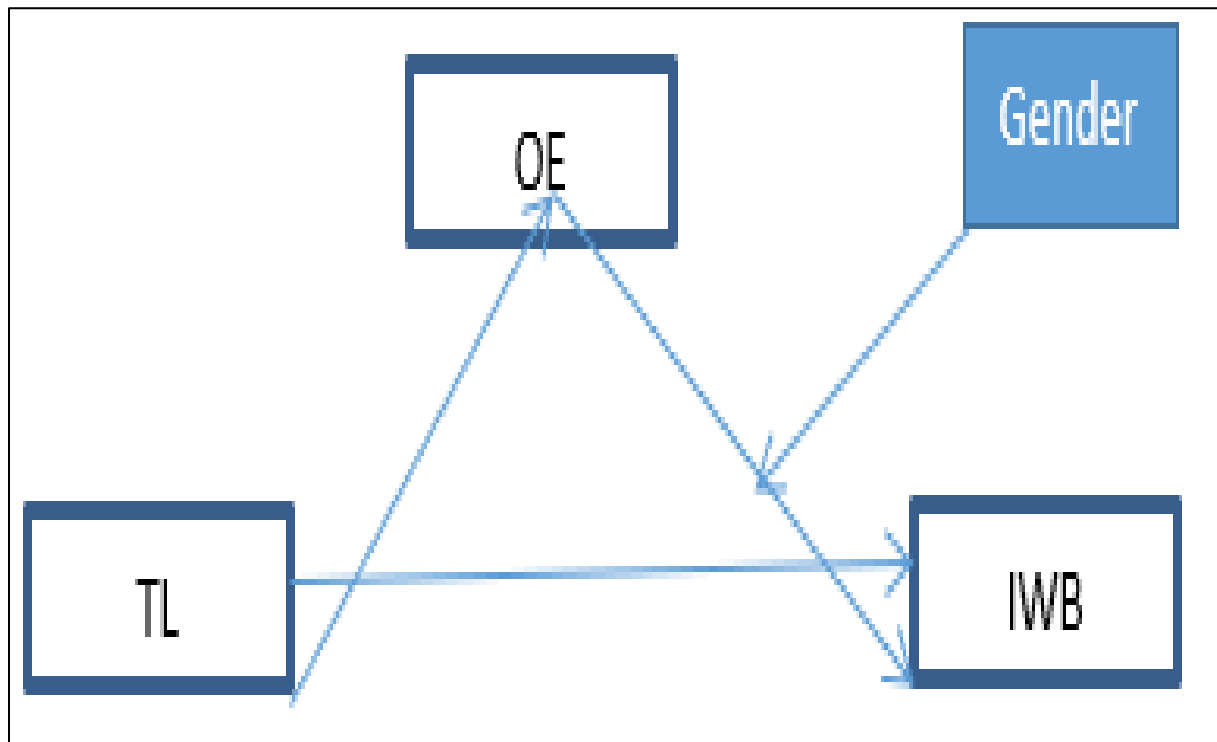


Figure 1 exhibits the expected relationship among TL, OE, gender and IWB. In this regard, the conceptual framework was developed with TL as the independent variable, IWB as the dependent variable, OE as a mediator, and gender as moderator. It is further displayed that TL influences teachers' IWB. This implies that the more deans practice TL, the better teachers will be engaged in innovative activities. In addition, two independent variables that influence teachers' IWB are included in the conceptual framework. OE is used as mediator variable to link TL and IWB, in explaining the relationship between them better. In this model, OE helps explain why TL leads to a higher IWB. The more deans demonstrate TL style, the more teachers become open to new idea; and the more teachers become open to new idea, the higher teachers' engagement in

innovation will be. Finally, gender is added as moderator to influence the indirect effect of TL on IWB through OE.

## Methods

### Sample

Since the study aimed at examining the effect of TL, OE and gender on IWB a quantitative descriptive survey research design was employed. It is a suitable research design as the researchers aimed at explaining the perception of large participants. Furthermore, it was cross-sectional survey research as data was collected from teachers at a specific time interval in examining the nature of relationships between a dependent variable and independent variables.

There were ten public universities in Amhara National Regional State. Among these, five of them were chosen as research unit of the study using lottery sampling technique. The universities included were Bahir Dar, Gondar, Wollo, Debre Tabor and Debark. Twenty colleges (four colleges from each university) were selected by employing random sampling technique as it gives equal chances to be part of the study. The population of this study were 1,726 teachers who had at least two years teaching experience in the university they are working in. This exclusion and inclusion of teachers' teaching experiences may help teachers have better exposure in reflecting on what is happening in the colleges related to the issues under study.

G\*power Software analysis was applied as a tool to compute sample size. An a priori analysis sample size calculation was computed before conducting the study. It was used to calculate the sample size which was necessary to determine the effect size, desired  $\alpha$  level, and power level. Using a test family with F-test and a statistical test with alpha error ( $\alpha=0.05$ ), effect size (small) =0.02 and power ( $1-\beta$  error) =0.80, from a total population of 1,716 teachers, the minimum adequate sample size 550 teachers were taken as participants of the study. Table 1 illustrated that through proportionate stratified random sampling technique 156 teachers from Bahir Dar, 189 teachers from Gondar, 72 from Debre Tabor, 66 from Wollo, and 67 from Debark universities were taken as sample of the study.

**Table 1**

*Population and Sample Size of the Study*

Universities	Population			Sample Size		
	Male	Female	Total	Male	Female	Total
Bahir Dar	298	189	487	95	61	156
Gondar	368	221	589	118	71	189
Wollo	109	97	206	35	31	66
Debre Tabor	143	82	225	46	26	72
Debark	111	98	209	36	31	67
Total	1,029	687	1,716	330	220	550

*Data source.* From survey (2022)



## Measures

In order to collect data a questionnaire that composed a total of 58 items was used. All the items were open ended types Accordingly, IWB was measured by De Jong and Den Hartong (2010) standardized questionnaire with ten items. The questionnaire reflects four underlying dimensions (*idea exploration, idea generation, idea promotion and idea realization*) using a 5-point Likert-type scale 1 = Never to 5 = always. A sample item was “I search new ways of instructional strategies to deliver courses”. The items were subject to CFA and the results show an acceptable fit to the one factor model.

Bass and Avolio (2000) standardized Multifactor Leadership Questionnaire Form 5X was applied to measure TL. This questionnaire comprises 20 items in which teachers rate the extent to which they agree whether deans display TL on a five-point Likert-type scale ranging from 1 =Strongly Disagree to 5= Strongly Agree (e.g., the dean encourages you to look at problems from different angles; the dean considers the moral and ethical consequences of decisions). The results of confirmatory factor analysis (CFA) show an acceptable fit to the one- factor model. Finally, OE was measured using items developed by Costa and McCrae (1992). Teachers were presented with 10 items in the OE scale, and were asked to indicate their level of agreement about how accurately each statement describes them (e.g., I am curious for new ideas; I am imaginative). Items were rated using a 5-point Likert-type scale ranging from 1 =never to 5 =always. The results of CFA showed an acceptable fit to the one-factor model.

## Data Analysis

Structural equation modelling (SEM) analysis technique was used to examine the effect of TL, OE, and gender on IWB. In the analysis, SPSS Amos 26 software program was applied. Furthermore, PROCESS macro model 14 was used to investigate the moderated effect of gender on the indirect impact of TL on IWB through OE. According to Hayes (2022), “moderated mediation analysis is used when the analytical goal is to describe the conditional nature of the mechanism by which a variable transmits its effect on another (p. 409).” This conditional indirect effect quantifies how differences in TL map onto differences in IWB indirectly through OE depending on the type of the moderator(gender). Finally, the Index of moderated mediation was tested with a 95% bias-corrected bootstrap confidence interval based on 5,000 replications. Entries are unstandardized regression coefficients. In addition, conditions for moderators are the mean and plus or minus one standard deviation from the mean.

## Results

Prior to data analysis, missing data and outliers were checked and corrected. To drop multivariate outliers, data were examined using a Mahalanobis distance test. The linear relationship between predictors and criterion variables of this study was checked using scatter plot of standardised residuals against each of the predictor variables in the regression model. Multivariate normality was checked using Normal P-P plot. This plot helped determine whether

the data set was normally distributed. The assumption of multi-collinearity was also assured by variance inflation factors and tolerance values. In addition, to check the assumption of autocorrelation, Durbin-Watson statistic was employed. Finally, homoscedasticity was checked by examining whether the variance of the residuals is constant or not through visualization of the standardised residual and standardised predicted values plot. Accordingly, seven outliers were identified and removed. Next, the assumptions of structural equation modelling namely: linearity, multivariate normality, multicollinearity, autocorrelation and homoscedasticity were checked. The results suggest that the entire assumptions have been met.

Prior to testing specific hypothesis, Cronbach alpha, means, standard deviations and correlations were examined. The results in Table 2 show that TL correlates with OE ( $r=.480$ ,  $p<.05$ ) and with IWB ( $r=.313$ ,  $p<.05$ ). It was also revealed that OE was correlated with IWB ( $r=.533$ ,  $p<.05$ ). The results further suggest that all the possible inter-correlations were significantly and positively correlated with each other. This shows that teachers with high scores on OE tend to have higher scores on IWB compared to those with lower scores on OE. This scenario has the implication that college deans who display TL behaviors can promote teachers' IWB. The Cronbach's alpha for TL, OE and IWB were .918, .840 and .918 respectively.

**Table 2**

*Descriptive Statistics and Pearson's Correlations*

	$\alpha$	Mean	SD	1	2	3
TL(1)	.960	54.73	14.73			
OE(2)	.840	31.48	6.63	.313*		
IWB(3)	.918	19.103	3.11	.480*	.533*	

*Note.* N=543,  $p^* < .05$ (2-tailed)

**Confirmatory Factor Analysis**

A Principal Axis Factor with a Varimax (orthogonal) rotation was conducted on data gathered from 543 participants. An investigation of Kaiser-Meyer Olkin measure of sampling adequacy illustrates that the sample was factorable as Kaiser-Meyer Olkin values range between 0.891 to 0.964. When loadings less than 0.30 were excluded, the analysis produced seven-factor solution, namely: charismatic leadership, innovative leadership, openness to internal experience, openness to external experience, opportunity exploration, idea generation and idea implementation.

Before assessing the measurement and structure models, the researchers evaluated construct validity of the hypothesized model. In order to assess the convergent validity of the latent variables, Average Variance Extracted (AVE) for each variable was computed. Kline (2011) suggests that in order to endorse a measurement model for convergent validity, the AVE must be .5 or greater. In line with this, the results illustrate that the AVE of TL, IWB, and OE values fall in the range of .57 to .74 which are greater than the acceptable value of .5. This implies that all the

constructs in the current study satisfied the issue of convergent validity revealing that the indicators of each measurement model are sufficient to represent the respective constructs.

Next, discriminant validity of the constructs was checked through Fornell and Larcker's (1981) criterion of discriminant validity called square root of AVE. The square roots of AVE of the latent variables were less than the inter factor correlation coefficients between them. For example, the square root of AVE for the charismatic leadership (.64) and innovative leadership (.63) were less than the inter factor correlation coefficient between them ( $r=.87$ ). In addition, the square root of AVE for the openness to internal experience (.838) and openness to external experience (.786) were less than the inter factor correlation coefficient between them ( $r=.944$ ) indicating that discriminant validity was a concern in this study. Therefore, it can be concluded that the model did not satisfy discriminant validity criterion.

In order to improve the discriminant validity of such type of models, Brown (2006) and Farrell and Rudd (2009) suggest combining the constructs into a single construct to solve poor discriminant validity. Accordingly, charismatic leadership and innovative leadership were merged as single TL latent variable which is consistent with the conceptualization of Tejeda, Scandura, and Pillai (2001) and Tracey and Hinkin (1998) findings that the 4 components of TL are not distinct. Openness to internal experience and openness to external experience were merged as one OE latent variable which is inconsistent with the conceptualization of DeYoung, Quilty and Peterson (2007). Finally, opportunity exploration, idea generation and idea implementation were combined as one IWB latent variable that invalidated the conceptualization of Janssen's (2000) as three factors. In conclusion, in the current research three constructs: transformational leadership, innovative work behavior and openness to experience were developed.

In SEM analysis, the measurement model and structural model were examined for model fit. The measurement model deals with the relationship between the latent variables and indicators. Accordingly, the current study established a good measurement model fit for key concepts using latent variables (see Table 3). The hypothesized measurement model was tested and the results of overall Fit indexes illustrate a good fit (CMIN/df=3.2<.01, RMSEA=.06, IFI=.921, TLI=.921, CFI=.920). The control variables included in the SEM analysis were age and education level because they were considered as important factors that may influence teachers' behaviors. Since the measurement model showed a good fit to the data, analysis continued to validate the structural model (see Table 2). The results of the overall fit indexes demonstrate a good fit for the model ( $X^2/df=3.20$ , <.01; RMSEA=.06, CFI=.924, IFI=.924, TFI=.915). Therefore, it can be concluded that the data met the proposed theoretical expectations regarding the structural validity of the constructs under study.

**Table 3***Recommended and Actual Model Fit Indices*

Fit index	Recommended Value	Measurement Model	Structural Model
CMIN/df	<5 Preferable<3	3.20	3.20
IFI	>0.90	.921	.924
CFI	>0.90	.920	.924
TLI	>0.90	.912	.915
RMSEA	<0.08	.06	.06

*Note.*  $p < .01$ , IFI = incremental Fit Index, CFI =Comparative Fit Index, TLI = Tucker Lewis Index, RMSEA = Root Mean Square Error of Approximation

**Direct Effects**

To investigate the direct effect of TL on IWB (H1), SEM analysis was conducted. The results in Table 2 demonstrate that TL had a positive and statistically significant direct effect on IWB ( $\beta = .37$ ,  $p < .001$ ). Thus, hypothesis 1 was supported. The results also show that TL was positively associated with OE ( $\beta = .34$ ,  $p < .001$ ). In addition, OE has a statistically significant effect on IWB when controlling for TL ( $\beta = .44$ ,  $p < .001$ ). The analysis also generates a significant total effect of TL on IWB ( $\beta = .52$ ,  $p < .001$ ). This suggests that deans who display TL behaviors are likely to promote teachers' IWB.

**Mediation Analysis**

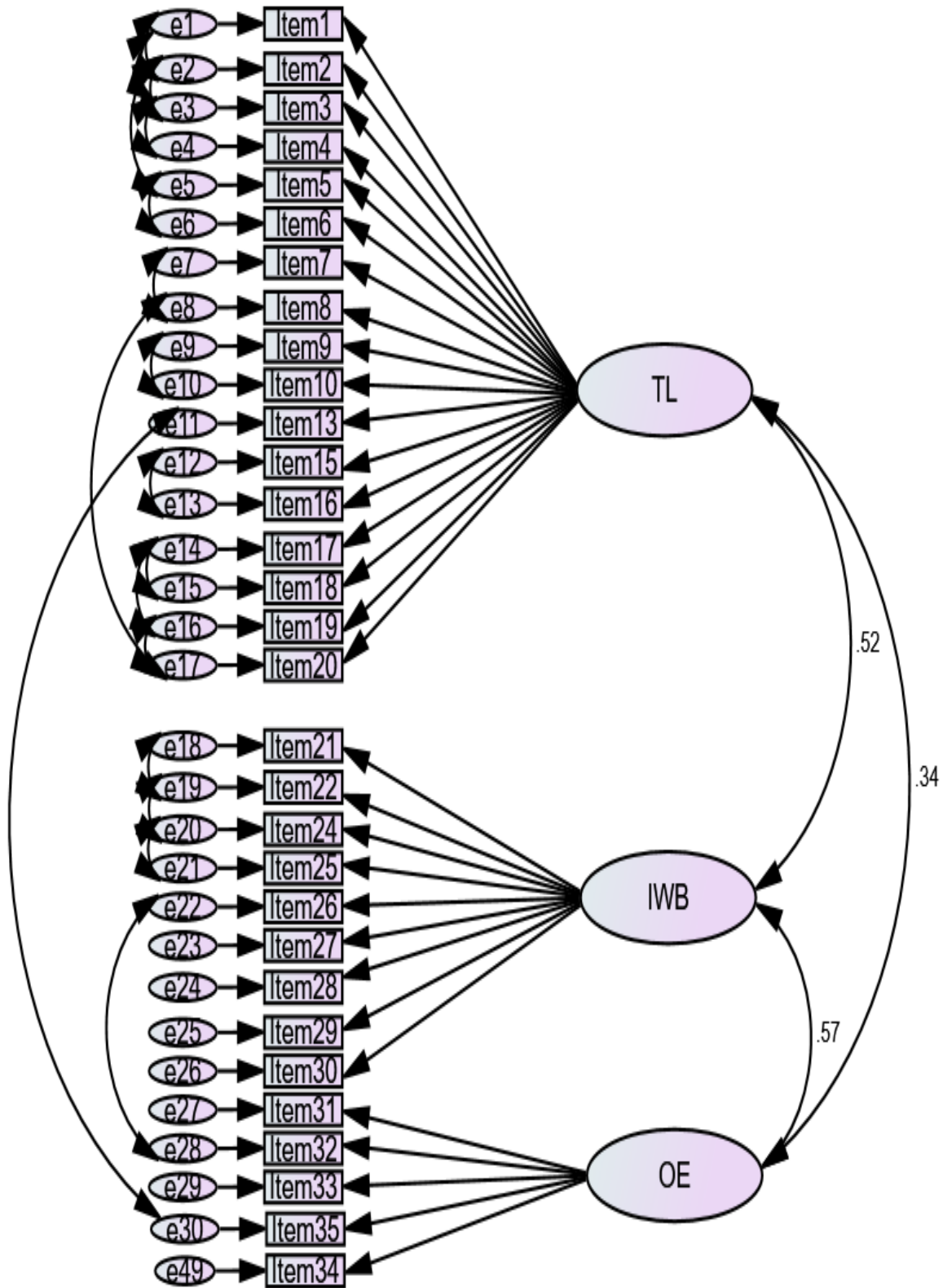
In order to examine the indirect effect of OE in the relationship between TL and IWB a mediation analysis was conducted (H<sub>2</sub>). The results in Table 4 revealed that TL significantly influenced OE ( $\beta = .34$ ,  $p < .001$ ) and OE in turn influenced IWB ( $\beta = .44$ ,  $p < .001$ ). Moreover, it is shown that TL indirectly influenced IWB ( $\beta = .15$ ,  $p < .001$ ). The results show the relationship between TL and IWB is partially explained by the mediating role of OE. Thus, hypothesis 2 was supported. This suggests that deans' TL not only directly influences teachers' IWB but also indirectly influences IWB through OE.

**Table 4***Regression Coefficient to Predict IWB*

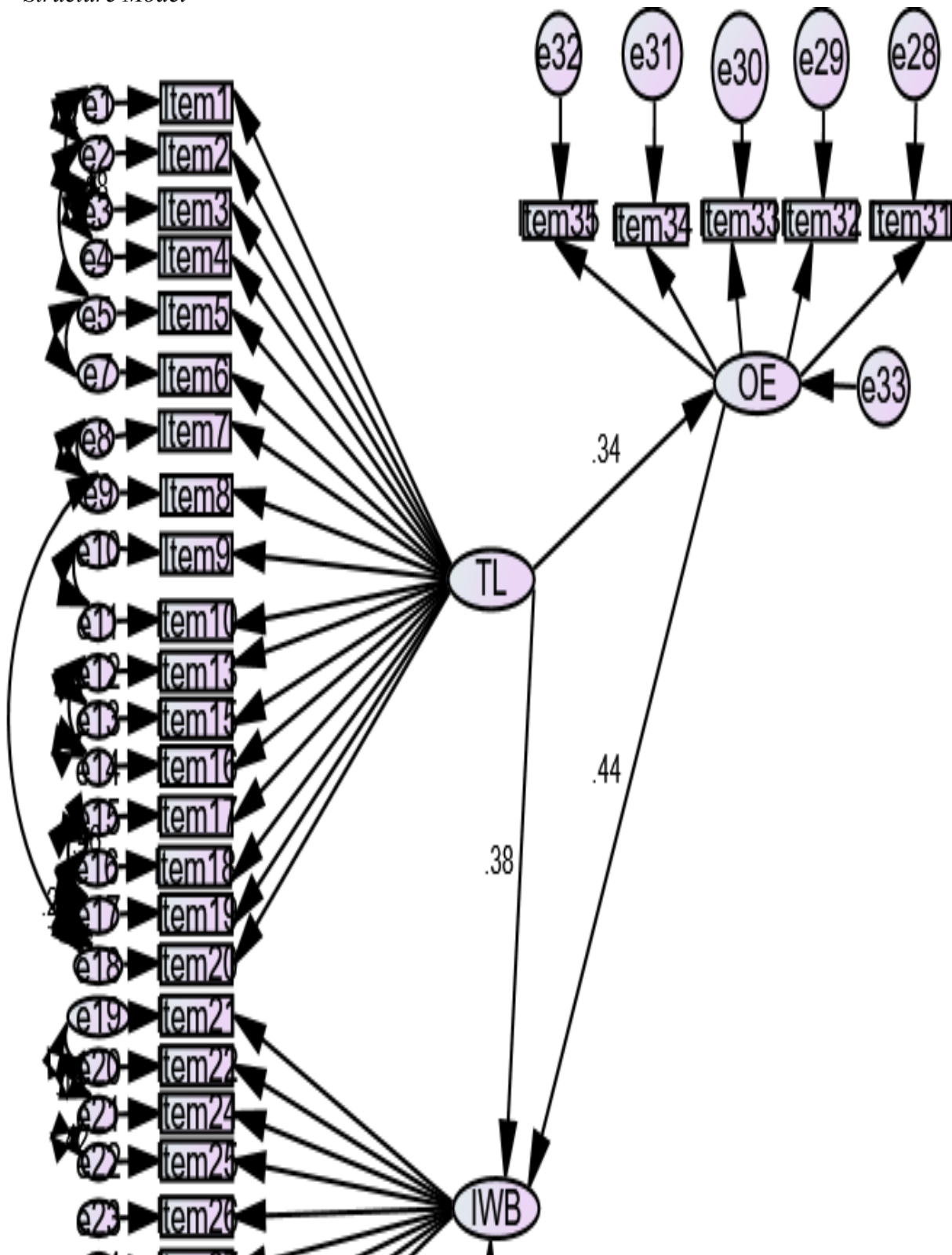
	B	SE	CR	P
OE ← TL	.34	.042	7.6	.001
IWB ← TL	.38	.038	9.8	.001
IWB ← OE	.44	.038	12.1	.001
IWB ← OE ← TL	.15	.025	5.00	.002
Total Effect	.53	.033	10.83	.002

*Note.*  $N=543$ ,  $P < .05$

**Figure 2**  
*Measurement Model*



**Figure 3**  
*Structure Model*



### Moderated Mediation Analysis

Gender was used as a moderator to examine the indirect effect of TL on IWB. Table 5 shows that the indirect effects of TL on IWB through OE were significant for both female teachers ( $B = .0632$ ,  $SE = .0202$ ,  $95\% CI = .0286$  to  $.1074$ ) and male teachers ( $B = .0669$ ,  $SE = .0162$ ,  $95\% CI = .0317$  to  $.0950$ ). This result reveals that the indirect effect of TL through OE varies for female and male teachers. Hence, it is imperative to check whether the change is significant or not. In order to realize this, an index of moderated mediation test was conducted. The same Table illustrates that index of moderated mediation is not statistically significant since the value zero fell between the lower and upper limit of  $95\%$  confidence interval (Index=  $-.0037$ ,  $CI = -.0505$  to  $.0407$ ). This implies that the indirect effect of dean's TL on teachers' IWB through OE is not moderated by teacher's gender. Hence based on these results, H3 was rejected.

**Table 5**

*Moderated Mediation Results for TL via OE across Gender*

Gender	B	Boot SE	Boot LLCI	Boot ULCI
Female	.0632	.0202	.0286	.1074
Male	.0669	.0162	.0317	.0950
Index of Moderated Mediation				
Moderator	Index	Boot SE	Boot LLCI	Boot ULCI
Gender	-.0037	.0234	-.0505	.0407

## Discussion

The current study examined the influence of TL, OE and Gender on IWB. The results demonstrated the path coefficients between TL and OE, between TL and IWB and between OE and IWB were positive and significant. These findings are consistent with previous studies (Afsar, et al., 2019; Jung, Chow & Wu, 2003; Raja & Johns, 2010; Sidaoui, 2007; Zainab, Akbar & Siddiqui, 2022). This suggests that college deans who practice TL behaviors can encourage learning, inspire, build trust, respect and support teachers. This in turn promotes teachers IWB to generate new ways of teaching and solving societal problems. Such an outcome is in line with the results of some previous research (Li, Zhao, & Begley, 2015; Shin and Zhou, 2003).

When the mediating effect of OE was examined in the relationship between TL and IWB, the results suggest that OE mediates the effect of deans' TL on teachers' IWB. This result is consistent with previous studies (Groves, 2020; Zainab, Akbar & Siddiqui, 2022) that indicate the impact of TL on OE. In addition, studies Yesil and Sozbilir (2013) illustrate that OE influences IWB. The transitivity of TL impact on OE, and OE in turn influencing IWB implies that OE mediates the link between deans' TL and teachers' IWB. Thus, it may be concluded that deans TL has an indirect effect on teachers' IWB. This entails that OE is not only an outcome of TL but also it is the foundation for TL to have an effect on IWB. Hence, hypothesis 1 was supported.

It appears that by demonstrating TL behaviors, deans can encourage teachers to be open minded, curious for new perspectives, challenge the existing practices that help them generate new ideas to improve educational practices in particular and societal problems at large. This result is in line with the claim that TL encourages innovative behavior (Messmann & Mulder, 2011) and teachers who are high on OE possess broader range and depth of experience, and more of an appreciation of the merits of new ways of doing things and the potential for improving and changing the status quo (George & Zhou, 2001).

The results also illustrated that gender did not moderate the indirect effect of TL on IWB through OE. This result is consistent with the findings of previous researches (Steyn & de Bruin, 2020; Kushnirovich & Heilbronn, 2013; Ponsa, Ramosa & Ramos, 2016) that reveal the existence of relationships between IWB and its antecedents do not differ as a function of gender. Supporting this, Nahlinder, Tillmar and Wigren(2015) found no significant difference in innovativeness between males and females. A study in Israel confirmed that gender has no significant influence on teachers' innovativeness. It is rather found that culture of the society had unique effect on individuals' innovative behaviors (Kushnirovich and Heilbrunn, 2013). This implies that being male or female did not affect teachers' innovativeness. However, some of the previous studies (e.g., Bozeman & Gaughan, 2007; Panagiotis, 2016) found that males are more innovative than females. The reason behind might be due to the male labeling of innovations, less visibility of females as innovators, and the selection of male dominated institutions for studies (Newnham, 2016).

## Conclusion and Implications

IWB has a potential positive effect on teachers' performance (Messmann & Mulder, 2011). In this study, it was found out that deans' TL has positive effect on teachers' OE. The results also revealed that OE affects teachers' IWB. This suggests that OE has a significant mediation role in the relationship that exist between deans' TL and teacher's IWB. Therefore, it can also be inferred that deans' TL and teachers' OE have the potential to make teachers more innovative. Based on this moderated mediation, it can be concluded that the effect of OE on IWB is not conditional as a function of teachers' gender.

This study has practical implications. For university presidents and human resource departments, the findings give an empirically supported knowledge on how to promote teachers' IWB and explain the contribution of TL and OE in organizational innovations. The practical implication of the findings is that deans' TL promotes IWB by encouraging teachers to challenge practices differently, by enhancing shared vision, and by building a supportive innovation climate. This study provides the basis for university presidents and college deans to encourage teachers make difference in universities by innovating ideas to solve educational problems in higher education institutions. Gender does not make any difference in teachers' innovativeness as far as dean's leadership is supportive to innovation and teachers have openness to experience personality. Hence, the deans should create conducive environment to innovation and develop teachers'



openness through training or other mechanisms. Irrespective of their gender categories they can engage themselves in IWB.

In addition, teachers' innovative behavior is not enhanced by a single factor. As with other human behavior, it is influenced by several factors. Therefore, college deans should combine different methods to boost teachers' IWB. These methods should focus on the combination of organizational and individual factors. The model developed in this study offers significant insights into the relationship between TL and IWB at a single regional state. Future research needs to study this model at national level.

### **Limitations and Future Directions**

There are limitations in the current study. First, the study used a cross-sectional research design whereby the data were collected at the same time and from a single source. Although a cross sectional data enable the generalizability of the findings, it prevented close investigation of several facets of the relationships in this study. The development of time series data and investigating the relationship between TL and IWB in a longitudinal research design would provide more insight into probable causation. Second, the sample is limited to universities located in a single National Regional State. It is also limited to public universities excluding private universities found in Ethiopia. This means that the results may not be generalized to all universities in the country. The sample selection may also limit the generalization of results to the overall population. Future studies should expand the range of sampling, such as inclusion of other regional universities in the country.

Third, this study used gender as the only moderator in the indirect effect of TL on IWB. This shows that the limited form of moderator included in this study may not enable to fully reflect the views of teachers in the universities. Future studies should add other demographic variables like education level, experience and field of specialization, etc. that may explain the current results better. Fourth, the results are based merely on teachers' responses. It is plausible that other sources of data, like college deans or students, might shed a diverse sight on their IWB. Fifth, the limited number of independent variables used in this research do not fully represent the perspectives of Ethiopian teachers towards IWB. This research may not be able to fully explain the factors that influence the perspective of teachers towards IWB. The limited independent variables may affect the final result of this research. Hence, future studies should consider other variables that make the study more comprehensive.

Lastly, Hayes PROCESS Macro Model 14 was employed to examine the role of gender in the indirect effect of TL on IWB through OE (Hayes, 2022). The model tests the moderated mediation effect of gender taking a single path from OE to IWB. The moderated mediation effect of gender might be different if gender was examined in the three paths simultaneously. Hence, future studies should use Hayes PROCESS Macro Model 59 to extend the present study's results on gender by examining OE as a potential mediator between TL and IWB.

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