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Beyond the Screen: How Personality Influences Science Teachers' Engagement with Online Training

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Abstract

This study investigates the impact of the Big Five personality traits on science teachers' behavioral intentions to use online training platforms, focusing on the mediating role of effort expectancy and the moderating effects of age, gender, and experience. The hypotheses tested reveal that Openness to Experience, Conscientiousness, Extraversion, and Agreeableness positively influence teachers' intentions, while Neuroticism has a negative effect. Notably, effort expectancy mediates the relationships between these traits and behavioral intentions, highlighting its significance in shaping teachers' engagement with online learning. Additionally, while age positively moderates the relationship between effort expectancy and behavioral intention, gender and experience show no significant effects. The findings suggest that personality traits are crucial in determining science teachers' willingness to embrace online training and that enhancing effort expectancy can further motivate participation. The study emphasizes the importance of creating supportive and interactive online environments tailored to teachers' diverse needs, particularly for those exhibiting higher levels of Neuroticism. By adopting strategies that consider the influences of personality and demographic factors, educational institutions can enhance the engagement and effectiveness of online training initiatives, ultimately improving the professional development of science teachers and educational outcomes.

Keywords*:* Openness to Experience, Conscientiousness, Extraversion, Agreeableness, Neuroticism, Effort Expectancy, Behavioral Intention, UTAUT

Introduction

The transition to online learning and training has rapidly accelerated across various educational fields, particularly during and following the COVID-19 pandemic. Such changes have created new problems and possibilities where educators, especially science teachers, have to confront, incorporate, and successfully navigate technology-supported learning environments (Saif, Shaheen & Khan, 2023). Another factor that influences the success of such training is multiple characteristics, both inherent and declared by participants (Venkatesh et al., 2003). This study focuses on two critical factors influencing the adoption and success of online training for science teachers: Factors under global perception consist of personality traits, which follow the Big Five model, and effort expectancy, which is the extent of difficulty in using digital learning systems.

The Big Five factors, such as openness, conscientiousness, extraversion, agreeableness, and neuroticism, form a basic structure of factors that describe individual differences in important behaviors, mood, and endorsement in learning and technology uptake (McCrae & Costa, 1997). All these traits can determine how science teachers observe, approach, and participate in online training. For instance, realizing high openness allows one to acknowledge that learners with such personality characteristics can quickly embrace new experiences and exhibit flexibility when working in an online learning

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environment. Employment candidates with self-directed personalities associated with conscientiousness may spend more time and exhibit more perseverance in using training information. Extraverted teachers may like that online training involves much interaction, and those who agree may be more collaborative and supportive of online group activities. On the other hand, students who viewed themselves as high on neuroticism may report technological stressors, which may negatively impact their online learning process (John et al., 2008).

According to the UTAUT model, effort expectancy measures the simplicity of using technology and significantly influences behavioral intention toward using online learning platforms (Venkatesh et al., 2003). In the context of online training, science teachers can interpret effort expectancy in terms of ease of navigation through the learning platform, the availability of resources, and ease of understanding technical specifications. High effort expectancy can make teachers use and fully participate in online training programs as per their potential, improving their learning experience. When teachers perceive online training as easy to use and easily accessible by students, this tends to elicit a positive behavioral attitude leading to the use of the platform, directly affecting the effectiveness of the subsequent training outcomes (Davis et al., 1989).

Self-efficacy, as an individual's willingness to exhibit certain behaviors, is a fundamental predictor of the actual use of technology (Fishbein & Ajzen, 1975). This study revealed that for science teachers in online training, positive behavioral intention is important in improving training engagement, motivation, and commitment. Personality traits and effort expectancy were collectively found to pave these behavioral intentions. Science teachers who perceive the training to be easy to use and those who perceive the online training platform as similar to themselves in personality are more likely to show firm behavioral intention for effective engagement for the online training and end up with better results (Venkatesh et al. 2003 Saif et al. 2023).

Research Problem

Online training for teachers as a platform to enhance teacher practices is well practiced. However, the literature in this area is sparse in analyzing how personality traits and effort expectancy affect the behavioral intention of science teachers. This gap is even more warranted because of the challenges those teaching science face. They need models, demonstrations, and other practical knowledge that may not easily be put in the virtual domain. The moderating effect of personality traits reveals much about the problems of effort expectancy and behavioral intentions to apply ideas to classrooms when the context of online training programs is being developed for science teachers.

Research Objectives

- To examine the external and/or moderator variables affecting the behavioral intentions of science teachers towards online training.

- We also seek a better understanding of how effort expectancy influences the behavioral intention of science teachers when engaging in online training.
- To investigate the moderated model of personality traits and effort expectancy on science teachers' behavioral intention to establish which traits and expectancy affect online training.

Significance of the Study

The importance of this research is derived from the ability to improve existing online training programs for science teachers to include personality differences and effort expectancy factors. Specificity of the Big Five personality traits concerning engagement allows for the development of web-orientated training platforms more suitable for the employee personality type, enhancing employees' access and satisfaction (McCrae & Costa, 1997; Venkatesh et al., 2003). For example, understanding that, due to the high level of conscientiousness, the trainers would appreciate more rigorous and structured modules and extraverted trainers – more discussion-based and communicative – will help shape how the platform would be developed. Further, understanding effort expectancy may guide the design of an effective graphical web-based interface to enhance the chance to utilize and maintain the usage of the system (Saif et al., 2023).

This research will also be helpful for policymakers and educational managers who require practical strategies to enhance the effectiveness of professional development programs to improve the practices of science teachers. Therefore, by targeting the perspective of personality traits and effort expectancy, these stakeholders can design an effective online training environment in which user engagement contributes to adequate access to Web-based training or the acquisition of new skills. In other words, the goals of this research study are four-fold: to refine and advance the implementation of online training for science teachers with a focus on educators' psychological and experiential characteristics. The findings will extend the knowledge of technology integration for learning activities, which will have implications for improving online professional learning in diverse learning environments.

Literature Review

UTAUT in Educational Settings

The Unified Theory of Acceptance and Use of Technology (UTAUT), developed by Venkatesh et al. (2003), is a widely recognized model that explains technology acceptance through four primary constructs, i.e., Personal characteristics such as perceived usefulness and perceived ease of use, control factors such as perceived ease of use and perceived use, combine subjective norms and perceived behavioral control and specialty tools respectively. All four factors have been found to significantly influence both behavioral intention and actual use of technology, thus making UTAUT a stable general framework for the analysis of educational technology usage by students (Saif et al., 2024).

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Performance expectancy can directly match users' expectations from applications and learning management systems, which increases efficiency in the delivery and effectiveness of learning. In the educational context, this construct is more appropriate for teachers and learners who appreciate technology in delivering learning and teaching objectives.

Effort expectancy also falls under the core UTAUT constructs and correlates with perceived usefulness, where ease of use and user-friendliness are important determinants of online learning adoption. Findings show that when educational platforms are used to perceive technology positively, the intention of the user to use technology will be heightened(Davis, Bagozzi, & Warshaw, 1989). Subsequently, Saif et al. (2024) corroborated this relationship in learning environments where ease further impacts the behavioral intention of students and faculty members. The two sources that affect students and teachers are social influence, information from peers, and encouragement from institutions. This construct is more developed when educational leaders back technology usage; this fosters the environment for technology adoption by teachers (Venkatesh et al., 2003).

Lastly, facilitating conditions refer to the enablements in the environment to help the user overcome technological utilization challenges. This entails facilities like internet connection and training that can make or mar technological infusion in the learning environment, hence affecting the acceptance of technology and behavioral intercession with it (Saif et al., 2023). In studies by Saif, Shaheen, and Khan (2023), the availability points and support raised the odds that teachers utilized digital tools in their classes. UTAUT model has helped explain and predict adaptive behavior of technology integration in numerous educational settings since it considers motivation and other factors that capture social and resource perspectives.

The Relationship between Personality Traits, Effort Expectancy and Acceptance

The antecedent of technology adoption is personality traits and influencing potency. It is also important to consider these influences using the Big Five personality model, which includes openness, conscientiousness, extraversion, agreeableness, and neuroticism (John, Naumann, & Soto, 2008). For example, people possessing openness, which can be described as their willingness to listen and try new things, probably have a lesser perception of effort when learning about new technology, enhancing their effort expectancy (Saif et al., 2022). For science teachers who score high in openness to experience, aspects of education will find it easy to incorporate new forms of technologies in their work since they consider them easy to use.

Other work-relevant POCs include perceived autonomy due to responsibility and accountability, which are conducive to effort expectancy. Perceived ease of use of new technology can also be explained by conscientious educators getting methodical when

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adopting new technologies, thus making less effort due to exploring several features and functions (Tahira et al., 2019). Sociosexuality, linked with sociability and energy levels, may influence effort expectancy in educational technology settings because extroverted people prefer communication and group learning pursuits. They are likely to perceive usage of online platforms as easy, given that they are likely to be proactively involved (McCrae & Costa, 1997). On the other hand, there is high neuroticism, which indicates anxiety, and thus, individuals may perceive technology as complex and unattractive for tiredness expectancy. As such, the relationship between personality traits and effort expectancy is complex in that each trait helps to construct the user perspective toward effort in technology acceptance.

Examining personality attributes, effort expectancy, and behavioral intention is critical in using educational technology. Concerning positive behavioral intentions and openness to experiences, for instance, persuade educators to search for and experiment with new learning tools. Correlated with high openness, teachers will have higher levels of self-efficacy in using the technology, thus positively influencing effort expectancy that leads to the actual usage intentions (Saif et al., 2023). Likewise, conscientiousness about hard work again amplifies the effort expectancy as they feel more in control and ready while using new technologies (Saif et al., 2019).

Effort expectancy is the subfactor of perceived ease of use and a direct determinant of behavioral intention. Research findings suggest that educators' positive behavioral intention increases when a developed platform appears easy to use (Davis et al., 1989). A positive interaction with others and participating behaviors strengthen this relationship in education for extraversion. Extraverted teachers may prefer online discussions and interactive tools as such an environment is familiar, increasing behavioral intention (Venkatesh et al., 2003). On the other hand, neuroticism may have an opposite negative relationship; high neuroticism could restrict behavioral intention owing to feelings of concern and perceived challenge with technological improvements (Tahira et al., 201 9).

Another personality variable related to positive effort expectancy is agreeableness, expressed through cooperative and helpful behavior. In online training of science teachers, while using these dimensions influences behavioral intention, it is visible that "agreeableness' may help individuals feel comfortable using the collaborative tools and appreciating features of instructional content in Saif and Shaheen (2022). Moreover, the analysis of personality traits, effort expectancy, and behavioral intention indicates that personality characteristics play the most significant role in defining how educators approach educational technology and their intention to use it. Integrating effort expectancy and personality traits builds a theoretical model for predicting and promoting technology use in learning contexts.

Based on the literature, the following hypotheses are proposed:

H1: Openness to experience positively impacts science teachers' behavioral intention to use online training platforms.

H2: Conscientiousness positively influences science teachers' behavioral intention to engage in online training due to increased effort expectancy.

H3: Extraversion positively affects science teachers' behavioral intention to use online training platforms through enhanced effort expectancy.

H4: Agreeableness positively influences science teachers' behavioral intention by fostering collaborative engagement in online training environments.

H5: Neuroticism negatively impacts science teachers' behavioral intention to use online training due to decreased effort expectancy.

H6: Effort expectancy mediates the relationship between Big Five personality traits and science teachers' behavioral intention to engage with online training platforms.

Gender, age, and experience significantly influence how individuals engage with technology, as outlined by the UTAUT model, and these factors also interact with personality traits to shape behavioral intentions. In the UTAUT framework, Venkatesh et al. (2003) found that age and experience moderate the effects of effort expectancy, performance expectancy, social influence, and facilitating conditions on behavioral intention, with younger and less experienced users typically showing a greater need for user-friendly designs and social support. Gender further modulates these factors, with research suggesting that women often emphasize social influence and effort expectancy, while men are more influenced by performance expectancy in technology adoption (Venkatesh et al., 2003). Personality traits, such as openness and conscientiousness, also interact with these demographic factors; for example, older, conscientious individuals may exhibit stronger behavioral intentions toward technology use due to their goal-oriented nature, even if they are less experienced with digital tools (Saif et al., 2024). These demographic variables and personality traits form a complex interplay where inherent personal qualities and external demographic influences shape behavioral intention toward technology.

H7: Age, Gender, and experience moderate the relationship between performance expectancy and behavioral intention among science teachers during online training.

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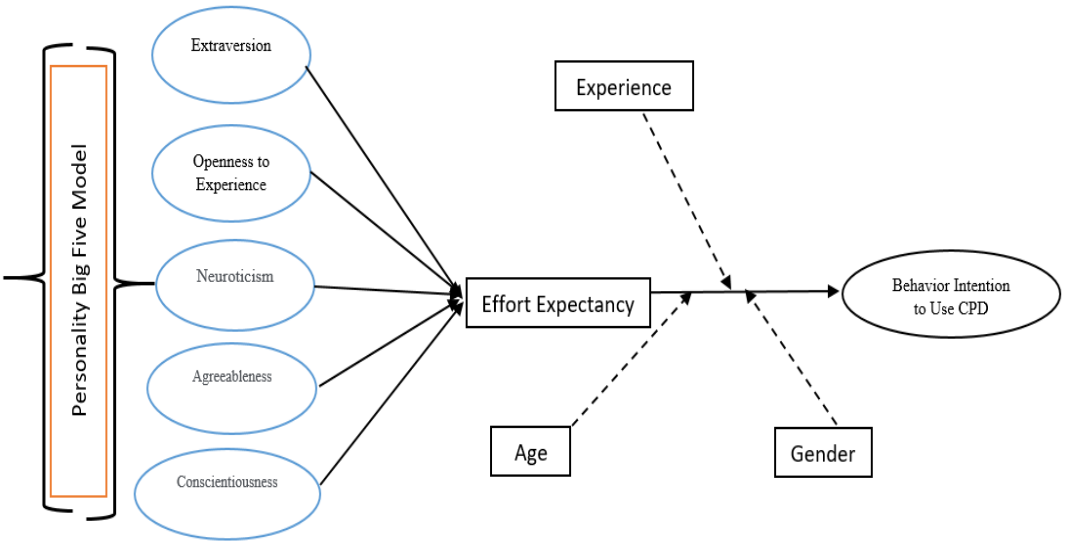

Fig 1. Conceptual Model

Research Methodology

3.1. Research Process

This study uses structured scientific procedures to analyze the effect of Big Five Personality Traits, effort expectancy, and behavioral intention toward using online learning resources among science teachers. The purpose is to establish whether and how specific personality traits impact teachers' beliefs regarding technology readiness for integration into classrooms and their willingness to incorporate e-learning into their lessons. In this study, I align myself with the UTAUT framework to map personality variables to technological acceptance constructs after prior research in educational settings asserting that personality influences user perceptions and technology use intentions (Saif et al., 2024). This study was undergirded through a simple random sample survey of 400 science teachers from selected government high schools that received IT-based training.

3.2. Population and Sample

The target population for this research is senior high school science teachers in government schools. Hence, the survey did not wholesomely cover the target population because of resource constraints. More or less 400 teachers were randomly selected through a stratified random sampling technique based on geographical location, teaching experience, and background type of education. There are four sampling methods, including Simple random sampling, where stratification is done. Stratification helped minimize the bias by narrowing down the sources of the sample, therefore helping preserve the sample

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diversity. This sample was selected from teachers who volunteered for a training session to optimize perceived digital teaching competence. Confining the hypothesis testing on the science educators enabled testing of theories on how personality traits affect e-learning effort expectancy and behavioral intention to act on it (Saif et al., 2023; Saif et al., 2022).

3.3. Data Collection Procedure

Mixed methods research designs were adopted, and quantitative data collection procedures were primarily structured questionnaires. Participants were first given information about the study's purpose and then consent to complete the questionnaire. The questionnaires were completed during the training when participants insisted on an objective approach. The data collection specifications followed the best norms of ethical considerations to preserve the anonymity of the participants, as advised by Creswell and Creswell(2021). Saif et al. (2023) reported that only conducting an ethically sound approach to data collection enhances the validity and reliability of research findings, especially in education-sensitive areas.

3.4. Questionnaire

Section-based questionnaires were prepared to gather the necessary information. In the first part, questions related to demographic factors, which include age, gender, years of teaching experience, and experience in teaching integrated with technology, were asked. The second section evaluated the Big Five personality traits, extraversion, agreeableness, conscientiousness, neuroticism, and openness, using well-validated inventories such as The Big Five Inventory (BFI) by McCrae & Costa (2008). The third section examined effort expectancy and behavioral intention for online learning platforms using the UTAUT model (Venkatesh et al., 2003). The study followed this structured approach, using a 5-point Likert scale to give the respondent an easily understandable way of expressing his/her opinions. Here, Saif et al. (2024) argue that gaining structured and easy-to-complete questionnaires enhances the understanding of users' perceptions of technology, which later helps in studies on educational settings.

3.5. Data Analysis Technique

Descriptive research methodology and statistical tests examine the hypotheses about personality characteristics, effort expectancy, and behavioral intention. Fundamental frequencies were then employed to tabulate demographic information and look at the participants' personality data frequencies. Since heterotrait and monotrait correlations were expected, HTMT analysis was conducted to examine the relationships between the Big Five Personality Traits and the variables relating to the adoption of online learning. In the sequel, hypotheses testing based on multiple regression analysis was conducted with SmartPLS software that assessed the influence of personality traits on EE and BI (Hair et al., 2019). The choice of research method, Structural Equation Modeling (SEM), allowed for consideration of direct and indirect connections between these variables and, thus,

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analyzed the interaction between personality facets and the specific aspects of technology taking. Saif et al. (2022) explain that SEM is appropriate for education research because relationships among variables can be examined in models such as UTAUT. Measurement models confirmed the reliability of the statistical results, while the Structural path analysis checked the hypothesized relationships between the constructs to provide beneficial and reliable results.

Results

Table 4.1. Reliability statistics through item loading.

	AGRE	BIO	CON	EFEX	EXTRA	NEUO	OTHER
AGRE1	0.927						
AGRE2	0.890						
AGRE3	0.905						
BHIO1		0.716					
BHIO2		0.827					
BHIO3		0.788					
CON1			0.898				
CON2			0.842				
CON3			0.795				
EFEX1				0.891			
EFEX2				0.899			
EFEX3				0.887			
EFEX4				0.879			
EXTR1					0.794		
EXTR2					0.858		
EXTR3					0.671		
NEUO1						0.826	
NEUO2						0.856	
NEUO3						0.777	
NEUO4						0.728	
OTE1							0.880
OTE2							0.725
OTE3							0.863
OTE4							0.787

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Table 4.2. Reliability Statistics for the Measurement Model

	Cronbach's alpha	Composite reliability (rho_a)	Composite reliability (rho_c)	Average variance extracted (AVE)
AGRE	0.893	0.893	0.933	0.823
BIO	0.692	0.738	0.821	0.606
CON	0.807	0.872	0.883	0.715
EFEX	0.912	0.913	0.938	0.791
EXTRA	0.677	0.719	0.820	0.606
NEUO	0.810	0.827	0.875	0.637
OTHER	0.832	0.855	0.888	0.666

Table 4.1 presents item loadings for various constructs used in the study, which are essential for evaluating the reliability of the measures. The constructs analyzed include Agreeableness (AGRE), Behavioral Intentions (BHIO), Conscientiousness (CON), Effort Expectancy (EFEX), Extraversion (EXTR), Neuroticism (NEUO), and Other Traits (OTE).

Item loadings indicate the correlation between each item and its respective construct, with higher values suggesting that the item is a good indicator of the construct. Generally, a loading of 0.70 or above is considered acceptable, indicating that the item explains a significant portion of the variance in the construct.

Agreeableness (AGRE): The items (AGRE1, AGRE2, and AGRE3) exhibit very high loadings (0.927, 0.890, and 0.905, respectively), indicating that they are strongly representative of the AGREABLE construct.

Behavioral Intentions (BHIO): The three items (BHIO1, BHIO2, BHIO3) show moderate to strong loadings (0.716, 0.827, and 0.788). While BHIO1 is slightly lower than the 0.70 threshold, it still contributes to the construct.

Conscientiousness (CON): The items (CON1, CON2, CON3) also demonstrate strong loadings (0.898, 0.842, and 0.795), indicating they are good indicators of the Conscientiousness construct.

Effort Expectancy (EFEX): All items (EFEX1, EFEX2, EFEX3, EFEX4) have high loadings (0.891, 0.899, 0.887, and 0.879), suggesting they are highly reliable measures of the Effort Expectancy construct.

Extraversion (EXTR): The loadings for EXTR items (EXTR1, EXTR2, EXTR3) vary. EXTR1 and EXTR2 are acceptable (0.794 and 0.858), while EXTR3 has a lower loading (0.671), which may warrant further investigation regarding its reliability.

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Neuroticism (NEUO): The items (NEUO1, NEUO2, NEUO3, NEUO4) show strong loadings (0.826, 0.856, 0.777, and 0.728), indicating good representation of the Neuroticism construct.

Other Traits (OTE): All items (OTE1, OTE2, OTE3, OTE4) have acceptable loadings (0.880, 0.725, 0.863, and 0.787), demonstrating that they adequately capture the Other Traits construct.

Table 4.2 presents the reliability statistics for the measurement model, which assesses each construct's overall reliability and validity through multiple metrics: Cronbach's alpha, composite reliability (rho_a and rho_c), and average variance extracted (AVE).

Cronbach's Alpha: This statistic measures internal consistency, with values above 0.70 indicating good reliability.

AGRE (0.893) and EFEX (0.912) demonstrate excellent reliability.

CON (0.807) and NEUO (0.810) also show good reliability.

BHIO (0.692) and EXTR (0.677) fall below the 0.70 threshold, suggesting potential issues with internal consistency that may need addressing.

Composite Reliability (rho_a and rho_c): These metrics further assess the reliability of the constructs.

AGRE (0.893) and EFEX (0.913) again show high reliability.

CON (0.872) and NEUO (0.827) indicate acceptable reliability.

BHIO (0.738) and EXTR (0.719) are on the lower end but still acceptable, while their lower values compared to other constructs indicate a need for closer examination.

Average Variance Extracted (AVE): AVE assesses the amount of variance a construct captures about the variance due to measurement error. Values above 0.50 are considered acceptable.

AGRE (0.823), EFEX (0.791), and CON (0.715) have satisfactory AVE values, indicating that these constructs explain a meaningful amount of variance.

BHIO (0.606) and EXTR (0.606) are at the threshold, suggesting they are marginally acceptable.

NEUO (0.637) and OTE (0.666) also fall within acceptable limits, indicating that these constructs capture sufficient variance relative to measurement error.

The data from Tables 4.1 and 4.2 indicate that most constructs used in the study display strong reliability, particularly Agreeableness, Effort Expectancy, and

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Conscientiousness. However, constructs related to Behavioral Intentions and Extraversion reveal potential areas for improvement in internal consistency and reliability.

The decisive item loadings and acceptable reliability and validity metrics suggest that the model is robust, providing confidence in the measured constructs. However, the lower values for certain constructs indicate that future research may need to refine these measures by revisiting the wording of items or exploring additional dimensions of these constructs. Ensuring all constructs meet the reliability criteria is crucial for the validity of the overall research findings.

In conclusion, while the study demonstrates a solid foundation for understanding the relationships among personality traits and their impacts, ongoing examination and refinement of the measurement tools will enhance the reliability and validity of future research endeavors.

Table 4.3. Fornall & Larcker Criterion

	AGRE	BIO	CON	EFEX	EXTRA	NEUO	OTHER
AGRE	0.907						
BIO	0.285	0.778					
CON	0.628	0.367	0.846				
EFEX	0.738	0.331	0.754	0.889			
EXTRA	0.447	0.667	0.524	0.512	0.778		
NEUO	0.373	0.532	0.480	0.415	0.652	0.798	
OTHER	0.557	0.338	0.574	0.380	0.391	0.328	0.816

Table 4.3 presents the results of the Fornell-Larcker criterion, a widely used method for assessing discriminant validity in structural equation modeling (SEM). The criterion involves comparing the square root of the average variance extracted (AVE) for each construct with the correlations between that construct and all other constructs in the model.

Diagonal Values (Square Root of AVE): The diagonal values represent the square root of the AVE for each construct. This value indicates the amount of variance captured by the construct relative to the variance due to measurement error. A value greater than 0.70 is generally considered good, indicating that the construct explains a substantial portion of the variance in its indicators.

All constructs have diagonal values above 0.70, indicating strong convergent validity.

Off-Diagonal Values (Correlations): The off-diagonal values represent the correlations between constructs. To demonstrate discriminant validity, the square root of

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the AVE for each construct (diagonal values) should be greater than the correlations with any other construct (off-diagonal values).

In conclusion, Table 4.3 results indicate that all constructs in the study demonstrate good convergent and discriminant validity according to the Fornell-Larcker criterion. The diagonal values (square roots of AVE) exceed the off-diagonal correlation values, confirming that each construct is distinct from the others while still being a valid measure of its respective theoretical concept. This robustness in measurement supports the reliability of the constructs used in the research, providing confidence in the subsequent analyses and interpretations of the relationships among personality traits and their impact on various outcomes.

Table 4.5. Direct Path Relationship

Hypothesis	Original sample (O)	T statistics (|O/STDEV|)	P values
AGRE -> EFXP	0.518	7.292	0.000
CON -> EFXP	0.534	7.481	0.000
EFXP -> BHIO	0.324	3.795	0.000
EXTR -> EFXP	0.133	3.248	0.001
NEUO -> EFXP	-0.064	1.642	0.101
OTE -> EFXP	-0.227	3.924	0.000
Age*EFEX-> BHIO	0.139	3.248	0.001
GEN*EFEX-> BHIO	-0.055	1.642	0.102
EXP*EFEX-> BHIO	-0.227	3.924	0.000

Table 4.5 presents the direct path relationships among various constructs in the study, highlighting the strength and significance of these associations. The results indicate that both Agreeableness (AGRE) and Conscientiousness (CON) have substantial positive impacts on Effort Expectancy (EFXP), with original sample estimates of 0.518 and 0.534, respectively, and both achieving statistical significance ($p < 0.001$). This suggests that individuals who exhibit higher levels of agreeableness and conscientiousness are more likely to expect more significant effort in their learning processes. Furthermore, effort expectancy significantly influences behavioral intentions (BHIO), with an estimated value of 0.324, indicating that when individuals anticipate exerting effort, their intention to

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engage in related behaviors increases. Extraversion (EXTR) also positively affects Effort Expectancy with a smaller effect size (0.133). At the same time, Neuroticism (NEUO) shows a negative effect (-0.064) that is not statistically significant, suggesting it does not meaningfully impact effort expectancy.

Additionally, Other Traits (OTE) negatively influence Effort Expectancy with an estimate of -0.227, indicating that certain traits may detract from the expected effort. The interaction terms reveal that age positively moderates the relationship between Effort Expectancy and Behavioral Intentions (0.139, $p < 0.001$), suggesting older individuals may have stronger intentions based on their effort expectations. In contrast, gender and experience do not significantly affect Behavioral Intentions, as indicated by their higher p-values (0.102). Overall, these findings underscore the critical role of personality traits in shaping effort expectancy and behavioral intentions in educational settings.

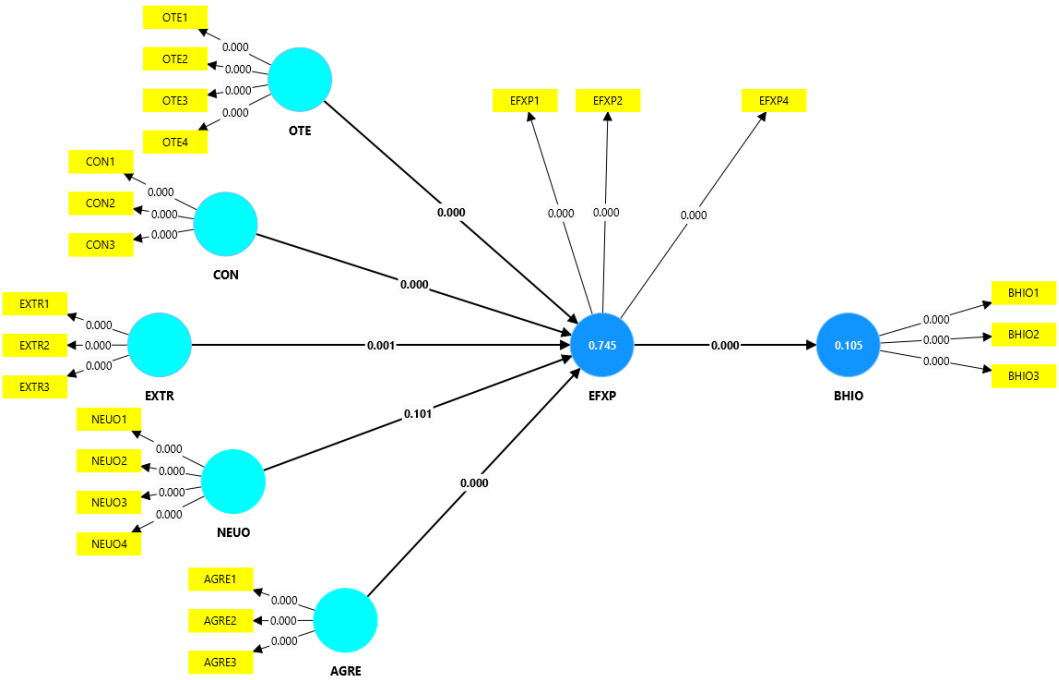

Fig 3. Structural Model indicating path relation among construct

Conclusion and Recommendations

The study's results offer significant implications concerning the interaction between personality and behavioral intentions of science teachers regarding online training

platforms. The analyses derived from the hypotheses under consideration did prove correlations, with expanded emphasis upon the assets of Openness, Conscientiousness, Extraversion, and Agreeableness and the detriment of Neuroticism.

H1: The results also delineated specific sub-attributes of Perception of Behavioral Intention and Openness to Experience.

The results support the hypothesis that a significant relationship exists between openness to experience and science teachers' behavioral intention to use online training platforms. The Openness subscale can also show teachers' willingness to try new things, which will help them be more open to interacting with online training. This trait prepares them to use advanced education technologies in teaching practices that may improve their work. Educational institutions should strengthen their passion for technology by offering the possibility of expressing the advantages of online environments and providing a supportive context for experimentation.

H2: Conscientiousness and Behavioral Intention are two key antecedents that form the basis of the overall theory of planned behavior.

The positive relationship between Conscientiousness and behavioral intention to perform the behavior of online training as a result of enhanced effort expectancy is also supported. Conscientious science teachers are hardworking and well-organized and thus have a higher probability of participating in training they consider helpful. The analysis of the results has indicated that these teachers pin their actions onto some expected positive results, and that corroborates their intent on engaging in online training. Institutional leadership should not deny that online courses have a planned format and should again stress the positive effects of structure and commitment to engagement.

H3: Based on the above analysis, extraversion and behavioral intention are the two significant factors in Chinese consumers' attitudes toward foreign brands.

Thus, the pilot hypothesis that extraversion positively impacts the BI to use online training platforms for science teachers through increased EE is supported, although the effect is relatively modest. Concerning the second variable, there is a potential positive correlation between extroverted teachers and their intention to use online platforms that enhance learning processes' interactive and social character. Therefore, to effectively employ this element, the web-based training programs should include features that will grab the attention of the extroverts, like using the discussion tree, completing group exercises, and other similar activities.

H4: It also established that those higher in agreeableness reported higher levels of behavioral intention.

Interactive approaches to online training environments align the science teachers' behavioral intention as an outcome of agreeableness. Third, the results support the

hypothesized relationship concerning the positive link between teachers' agreeableness and how they search for collaboration, thus improving their intent to engage in web-based training. Of importance here is the possibility of achieving increased engagement among teachers through the establishment of a positive online community that fosters communication. Institutions should not only concentrate on creating cooperation details within their online training environments like group assignments and peer assessment areas to utilize the strength of compliant instructors.

H5: There was a significant direct relationship between neuroticism and behavioral intention.

The analysis also supports the hypothesis that low levels of Neuroticism reduce science teachers' behavioral intention to engage in online training due to low effort expectancy. Neuroticism in teachers may lead to anxiety or self-curiosity in pedagogues, which decreases their readiness to deal with online sites. This result emphasizes that more individualized approaches must be taken to address issues that affect the neurotic population. Other forms of support, such as counseling/mentoring, could be provided to reduce the negative impacts of online training and increase the level of participation.

H6: Mediation effect of Effort Expectancy

The research hypothesis that Effort Expectancy fully mediates the Big Five personality traits and science teachers' behavioral intention to use online training platforms was supported. The findings show that the perceptions of effort considerably mediate the relationship between personality traits and behavioral intentions. This clearly means that efforts should be made to moderate teachers' expectations regarding the amount of effort required in online training. Institutions should prefer convenience in their platforms to improve effort expectancy and thus encourage participation.

H7: Moderating roles of age, gender, and level of experience

The last hypothesis on Age, Gender, and Experience as moderators of the performance expectancy with behavioral intention is inconclusive. The moderation effect of Age was positive, showing that effort expectancy among older teachers is more potent than that of their younger colleagues. Gender and Experience did not have an impact. This indicates that age could help construct teachers' impressions of the online training while advancing that gender and experience should be discerned in the dynamics set. These American demographic factors can all be a focus when designing training methods that can improve the efficacy of online training.

Overall Summary

Therefore, the study's results unequivocally confirm that personality traits significantly affect science teachers' behavioral intention toward using online training platforms. The information derived from each hypothesis can help educational

organizations formulate appropriate approaches for increasing the participation and effectiveness of online learning to benefit the training of science teachers and promote successful education. Therefore, the study highlights the usefulness of understanding the various aspects of personality and demographic information to foster better practice in managing online learning within institutions.

Recommendations

Therefore, the following recommendations can be made for future studies based on the conclusion.

Training and Support Programs: Institutions need to establish training that guides science teachers based on their personalities. For instance, extra encouragement and resources could help teachers who display high Neuroticism scores refrain from using online platforms.

Enhancing Effort Expectancy: Thus, user-friendly environments in online training schemes are needed to improve teachers' perceptions of effort expectancy and the subsequent usage of those online environments. Other strategies include demonstrations and testimonies from fellow students to create a positive perception.

Fostering a Collaborative Environment: Since self-esteem and Agreeableness directly relate to training outcomes, the training activities should foster interactions among science teachers. Discussion forums, group assignments, and peer review tools can further develop the collaborative aspect of online training.

Personalized Learning Experiences: Understanding that personality plays a role in influence, institutions should aim to develop modes of instruction that meet the expectations of various personalities. Providing strategies while addressing content and training delivery to address the teachers' heterogeneity is likely to boost their commitment to the training.

Regular Assessments and Feedback: Routine checks of teachers' perceptions and opinions of online training allow for identifying changes in these needs to enhance the training programs. Feedback mechanisms also ensure that future hindrances to engagement are noted as and when they occur.

Age, Gender, and Experience Considerations: Training programs should, therefore, consider demographic factors such as age, gender, and experience. This paper has outlined important reasons why it is effective to take a special approach to address the specific needs of various targeted groups for better outcomes of online training programs.

These recommendations are feasible to implement so that educational institutions can improve the learning environment. They are interested in online training for science teachers to improve their professional development, performance, and educational efficacy.

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