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Abstract

This study aims to examine the relationship between personality traits and innovation skills among students in the Faculty of Islamic Sciences in Indonesia. Personal information form, Five Factor Personality Scale and Innovation Skills Scale were used as data collection tools. According to results it can be stated that there are significant relationships between the personality traits and innovation skills of students in the Faculty of Islamic Sciences. Agreeableness and self-discipline dimensions are prominent factors in students' personality structures that support their innovation skills. Differences were observed in terms of gender and age variables at students. The higher self-discipline and neuroticism-based personality traits of female students determined. In terms of innovation skills, significant differences were found among students in the Faculty of Islamic Sciences based on their gender. It was determined that male students have a significantly higher perception of innovation skills. It was found that newly enrolled students (18-20 age group) have higher neuroticism traits compared to their older peers. Regarding the educational level variable, analyses showed no significant differences in the sub-dimensions of neuroticism, self-discipline, agreeableness, and openness to experience based on the educational level. In addition, results indicate that all personality traits show a significant relationship with innovation skills. While there is an inverse relationship between neuroticism and innovation skills, the other personality dimensions (extraversion, agreeableness, conscientiousness, and openness to experience) exhibit a positive relationship. These results indicate the need for educational programs and support services to be designed to enhance students' personality traits and innovation skills. Additionally, considering demographic factors such as gender and age is important to understand students' individual differences and needs.

Introduction

Religious education involves the critical analysis and examination of religious beliefs, practices, and values. The aim of religious education is to cultivate ethical growth, spiritual development, and an understanding of the

significance of religious traditions and their impact on society. In addition, religious education provides a platform for exploring various religious perspectives and their contributions to global culture and history (Goldburg, 2010; Freathy & Davis, 2019). By delving into the complex nature of religious traditions and their intersections with social, political, and cultural issues, students of religious education are equipped with a comprehensive understanding of the role that religion plays in shaping our worldviews, attitudes, and behaviors (Chater & Erricker, 2013; Freathy & John, 2019).

The field of psychology has demonstrated a longstanding interest in investigating personality, which refers to a distinct amalgamation of traits, behaviors, and cognitive mechanisms that shape an individual's unique outlook and engagement with the external environment (Hampson, 2012). The development of an individual's personality is influenced by a multifaceted interplay of genetic, environmental, and sociocultural factors, which play a crucial role in shaping their cognitive aptitude, social relationships, and personal development (Muhid et al, 2020; Rossier, Dahourou & McCrae, 2005).

The integration of psychology and religious education has garnered significant development in academic circles. The emerging trend is to encourage these two fields to not only provide theoretical insight into spiritual constructs for elucidating human development but also to showcase their empirical efficacy in enhancing human functioning (Saroglou & Muñoz-García, 2008; Piedmont & Wilkins, 1999). The intersection of these two domains can offer a more comprehensive understanding of human behavior, and provide novel insights into the interaction of various psychological, spiritual, and theological factors that contribute to individual well-being (Feather, 2005; Roccas, 2005). The incorporation of spiritual and religious elements in psychological interventions may have the potential to address existential concerns and provide a deeper sense of meaning and purpose in life, which can positively impact psychological outcomes. The convergence of psychology and theology can therefore serve as a powerful catalyst for advancing the fields of mental health and spiritual development (Arifah et al., 2019; Nofle & Robins, 2007; Piedmont, 1999). Theoretically, the area of spirituality provides a fertile ground for identifying psychologically useful individual difference variables. Empirically, new constructs hold the potential for expanding the ability to predict salient life outcomes. Therefore, the integration of psychology and religion holds much exciting promise for expanding the understanding of people and the needs they seek to satisfy (Piedmont, 1999; Genia, 1991).

Individual differences in religion have been consistently found to relate to personality, in terms of both strict personality traits and their cultural adaptations (e.g., values). Over the last 30 years, researchers have focused on the dominant models of these two domains, the Five-Factor Model (FFM) of personality (Piedmont 2005; Saroglou & Galand, 2004) and Schwartz's 10-value model (Roccas 2005; Saroglou, Delpierre, and Dernelle 2004). In addition, the most used models in research are Eysenck's Personality Model (PEN), MMPI personality Inventory, and Cloninger's biosocial model (TCI) (Uysal, 2006; Piedmont, 2013). An individual's distinct behavioral, emotional, and cognitive patterns are shaped by a multitude of psychological traits and dimensions that constitute their personality. The approach that tries to identify and describe the basic characteristics that guide the behavior of the individual in psychology is called the "personality traits" approach. A trait is any characteristic that differs from person to person in a relatively permanent and consistent manner. Psychologists working in the

field of personality traits theory try to identify the main characteristics that will provide a meaningful personality description and to find ways to measure these characteristics (Mehmedoğlu, 2004). FFM is a widely recognized framework amidst the numerous theories and models of personality. FFM argues that traits are biologically based, pointing to evidence that the five factors and their structure are heritable (McCrae, Jang, Livesley, Riemann, & Angleitner, 2001; McCrae & Costa, 1999). Because all people share the same human genome, FFT claims that certain characteristics of traits, including their structure and development, should be universal. Yet it is obvious that cultures differ in the behaviors their members typically exhibit, and FFT accommodates this fact by distinguishing sharply between traits, which are construed as basic tendencies, and the category of characteristic adaptations (such as skills, beliefs, and attitudes) that directly guide behavior (Rossier, Dahourou & McCrae, 2005). Therefore, the FFM can serve as a useful reference point for developing and evaluating religious variables.

FFM posits that personality can be elucidated by five primary dimensions or traits, namely extraversion, agreeableness, conscientiousness, neuroticism, and openness to experience (Kwang & Rodrigues, 2002; Piedmont, 1999). The construct of extraversion pertains to an individual's inclination towards seeking social stimulation and exhibiting extroverted, forceful, and spirited behaviors. Agreeableness is a personality trait characterized by a tendency to exhibit sympathy, cooperation, and thoughtfulness towards others. Individuals with high levels of agreeableness exhibit traits such as affection, empathy, and a proclivity towards maintaining harmonious interpersonal connections (Shalley, Zhou & Oldham, 2004; Liang, Chang, & Hsu, 2013). Individuals who exhibit conscientiousness as a personality trait are often perceived as reliable, possessing a high degree of self-control, and motivated by achieving objectives. Individuals who possess a strong sense of responsibility typically exhibit a high level of organization and meticulous attention to detail. Neuroticism is a personality trait characterized by a heightened tendency to experience negative emotions such as anxiety, depression, and mood fluctuations. The trait of Openness to Experience pertains to an individual's inclination towards being receptive, curious, and adaptable towards novel concepts, encounters, and perspectives. Individuals exhibiting elevated levels of openness tend to possess a proclivity for innovation, creativity, and a willingness to entertain unconventional options (Biderman, McAbee, Job Chen & Hendy, 2018; Rossier, Dahourou & McCrae, 2005; McCrae & Costa, 1999).

Innovation refers to the process of creating and implementing new concepts and products, as defined by Weintraub and McKee (2019). Innovation is generally understood as “the successful introduction of a new thing or method” (Brewer and Tierney, 2012, p. 15). Fundamentally, innovation consist of two essential elements. Firstly, there is the idea or item that is new to a particular individual or group, and secondly, there is the change that arises from the adoption of the idea or object (Evans & Leppmann, 1970). Therefore, innovation involves three critical stages: the conception of an idea, its execution, and the outcome that results from its implementation and brings about change. In the domain of education, innovation assumes particular significance due to its pivotal role in shaping a sustainable future. As Hoffman and Holzhter (2012) aptly state, innovation is akin to the biological process of mutation, which drives species evolution and competitiveness for survival. As such, innovation should be viewed as an essential instrument for achieving positive and necessary change. Constant innovation is indispensable in any human endeavor to ensure its sustainability (Songkram, Songkram, Chootongchai, & Samanakup, 2021; Yılmaz & Sünbül, 2009).

In education, innovation can manifest in various forms such as a novel pedagogical theory, methodological approach, teaching technique, instructional tool, learning process, or institutional structure that, upon implementation, generates a significant change in teaching and learning, resulting in enhanced student learning outcomes (Brewer & Tierney, 2012). Therefore, innovations in education are aimed at improving learning quality and/or increasing productivity and efficiency in the learning process (Camins, 2015; Meyer, Rose & Gordon, 2014). Similarly, educational innovation encompasses all parties involved in education: learners, parents, teachers, educational administrators, researchers, and policy makers, and demands their active participation and endorsement. When it comes to learners, cognitive processes occurring in the brain during learning must be examined, with a focus on identifying and cultivating abilities, skills, and competencies. These include enhancing attitudes, dispositions, behaviors, motivation, self-assessment, self-efficacy, autonomy, as well as communication, collaboration, engagement, and learning effectiveness (Serdyukov, 2017). In this context, it is important to develop students' innovation skills and examine them in terms of various variables.

The correlation between personality traits and religious education has received relatively limited attention in scholarly literature, despite being a subject of interest. Several studies have investigated the correlation between personality traits and religious experiences, attitudes, and beliefs (Nnorom, 2013; Akomolafe, 2013; Baht, 2016; Rani, 2017). Empirical research has indicated that individuals exhibiting elevated levels of conscientiousness may exhibit a greater propensity to engage in religious practices, adhere to religious doctrines, and possess a robust ethical framework and moral compass. In addition, individuals who obtain high scores on the agreeableness scale may exhibit a greater inclination towards spirituality, empathy, and compassion (Thomas & Cassady, 2019; Treiber, 2010; Nighute, S., & Sadawarte, 2014).

Studies have shown that emotional tests and personality dimensions significantly predict students' achievements in other fields and in the religious domain. Research indicates that higher scores on reasoning tests are associated with higher achievement in religious subjects, while lower reasoning scores are linked to lower achievement in religious subjects (Díaz-Morales & Escribano, 2013). Similarly, Alsager & Milton (2016); Halim & Chieng (2016); Gómez-Veiga, Vila Chaves, Duque and García Madruga (2018); Williamson & Anderson (2019) have shown that students' personality traits are strong predictors of their academic achievements in religious subjects. In related studies, no study has been found that addresses the innovation dimension. This research is important in terms of addressing students' personality traits and innovation skills in the context of religious education and filling the gap in the literature.

The aim of this study is to examine the relationship between personality traits and innovation skills among students enrolled in Islamic Sciences Faculties, with a focus on understanding the potential influence of gender, age, and academic level.

The research questions are given below:

1. What are the prominent personality traits displayed by students studying in Islamic Sciences Faculties?
2. How do gender, age, and academic level influence the personality traits of students in Islamic Sciences Faculties?

3. Do students in Islamic Sciences Faculties differ in terms of their perception of innovation skills?
4. How do gender, age, and academic level relate to the perception of innovation skills among students in Islamic Sciences Faculties?
5. What is the nature of the relationship between personality traits and innovation skills among students in Islamic Sciences Faculties?
6. To what extent do personality traits predict innovation skills among students in Islamic Sciences Faculties, considering the influence of gender, age, and academic level?

Method

The present investigation employs a quantitative research paradigm to explore the correlation between the Big Five personality traits and innovation skills of students enrolled in Islamic Sciences Faculties in Indonesia. This research employs two primary variables, namely the dimensions of the Big Five Personality Scale, comprising extraversion, emotional stability, openness to innovation, conscientiousness, and agreeableness, and the dependent variable, "Innovation Skill." The research in question is categorized as a form of quantitative inquiry, with a specific focus on exploratory-descriptive research. The classification is attributed to the random selection of the sample from a predetermined population. The data was obtained via a survey methodology administered to the selected sample. Furthermore, the present investigation is classified as a descriptive and cross-sectional study.

The research is focused on the population of Islamic Sciences Faculties located in Indonesia. This research is characterized by a quantitative approach and centers on the voluntary participation of students enrolled in Islamic Sciences Faculties located in Indonesia. The confidentiality of both the participants and the institution was maintained during the research, as their disclosure was deemed unnecessary. The study utilized the convenience sampling method. Convenience sampling refers to the process of selecting samples that are readily available and feasible to implement, often due to limitations such as time, financial resources, and personnel.

The research sample comprises of individuals who are enrolled in Islamic Sciences Faculties in Indonesia during the academic year of 2022-2023 and are pursuing their higher education at the university level. The study's sample comprises 266 participants, who are representative of the student population. In order to mitigate the potential for data loss, a sample size of 278 students was selected using appropriate sampling techniques. The study did not encounter any outliers, and a total of 266 response papers were evaluated after the exclusion of 12 partially completed response forms. Convenience sampling is a non-probability sampling technique that involves selecting readily available units of the population due to constraints such as time, financial resources, and labor (Fisher-Giorlando, 1992). The study's sample comprises 74 female students, accounting for 27.82% of the total, and 192 male students, representing 72.18% of the total. The sample's mean age of the student population is 22.87, with a standard deviation of 4.02.

Data Collection Tools

In this study, personal information form, Five Factor Personality Scale and Innovation Skills Scale were used as

data collection tools. Permission was obtained from the administrations of the relevant universities for the suitability of the questionnaire and it was informed that the study was for scientific purposes only. In this context, it was shared that the name of the educational institution to which the questionnaire was applied would be kept confidential. Both the managers from whom permission was obtained and the employees who supported the questionnaire filling process were given detailed information about the purpose of filling the questionnaire and the questionnaires. In order for the survey results to be converted into data, it was specifically stated that the participants should fill in the questionnaires completely and accurately. Some measures were taken to minimize response errors. In this context; first of all, the participants were promised that their answers would remain confidential and would not be shared with anyone. Participants were given a maximum of 25 minutes to answer the questionnaire. During this time, the participants were prevented from distracting themselves with different tasks and influencing each other through the people who supported the completion of the questionnaires.

Five Factor Personality Scale: The personality measurement tool developed based on the Big Five Model of Personality is an inventory consisting of 44 items answered on a five-point Likert scale from 1 (Strongly Disagree) to 5 (Strongly Agree). The inventory is scored on five basic factors (openness to development, self-control/responsibility, mildness/temperance, emotional inconsistency, extraversion). The original English version of the inventory was developed by John, Donahue, and Kentle (1991). The Cronbach's alpha coefficients of the subscales of the English version of the inventory ranged between .73 and .80, while those of the United States version ranged between .79 and .88. In a study on the construct validity of the scale, the factor loadings of the items in the United States version were found between .37 and .78 (Benet-Martinez & John, 1998). The five-factor personality scale was chosen for this study because its reliability and validity were demonstrated in this cross-cultural study. In this study, the Cronbach's alpha reliability values of the five-factor personality scale were found to be .81, .78, .78, .78, .73 and .76 for "neuroticism", "extraversion", "openness to improvement", "agreeableness" and "self-discipline", respectively. The higher the scores obtained from the scale, the more prominent the related personality trait is.

Innovation Skills Scale: The Individual Innovativeness Scale developed by Hurt, Joseph, and Cook (1977) and adapted into Indonesian by the researcher was used to determine the perceptions of university students studying religion towards their innovation skills. Necessary permissions were obtained before the English form of the original scale was adapted into the native language. The original scale consists of 20 items and is a 5-point Likert scale. Each statement in the scale is scored with values between 1 (strongly disagree) and 5 (strongly agree). The Cronbach's alpha internal consistency coefficient of the English form of the scale was reported as 0.89. In order to reveal the general innovativeness levels of individuals, a general score is obtained by summing the scores obtained from the scale items. In the adaptation process of the scale, a systematic approach was adopted and the scale was adapted into Indonesian by taking into account the culture, language, understanding, concept and sample characteristics. In order to translate the scale from English, which is the source language, into Indonesian, it was translated by two people who know both languages and the field. Back translation method was used to translate the scale into Indonesian. It was translated into English by field experts and the expressions in the translations were compared with the original text. As a result of the comparison, the Indonesian text was obtained. While translating, attention was paid to the grammatical structure and differences between Indonesian and English,

cultural and psychological differences. Exploratory factor analysis and confirmatory factor analysis were conducted for the construct validity of the scale. In addition, expert opinion was obtained to ensure the content validity of the scale. The experts stated that the scale items were comprehensible in both English and Indonesian, the items were related to the concept to be measured, and the scale was culturally appropriate. The construct validity of the Indonesian form of the scale was examined by factor analysis. The single-factor scale explained 52.36% of the total variance. As a result of the factor analysis, it was decided to remove 1 item from the scale. As a result of the final evaluations, it was decided that the Indonesian version of the scale consisted of 19 items. Cronbach's alpha internal consistency coefficient was calculated to determine the reliability of the scale and the internal consistency coefficient was reported as 0.81. In this study, the Alpha coefficient calculated for the scale was 0.84. An alpha coefficient of 0.70 or higher indicates that the reliability of the scale is at a sufficient level (Adadan & Savasci, 2011). The internal consistency coefficient obtained in this study shows that the reliability of the innovation scale based on internal consistency is at a high level.

Data Analysis Techniques

The independent variables of this study consist of the categories of five factor personality traits, gender, age, grade, and level of education. The dependent variable of the research is innovation skill. The score distributions obtained from both scales and other independent variables were coded and entered into the computer. Then, SPSS 26.0 package program was used to analyze the data.

Before starting the analysis, the data distribution was examined and it was examined whether the Five Factor Personality Traits and Innovation Skills scales were normally distributed in the independent variable categories. Parametric tests were applied in independent variables where the data were normally distributed and the number of subgroups was over 30. Independent Sample t-Test was applied to determine whether the mean scores of Five Factor Personality Traits and Innovation Skills differed significantly according to gender and level of education. One-Way Analysis of Variance was used to determine whether the mean scores of Five Factor Personality Traits and Innovation Skills differed significantly according to age group and grade level. Pearson Product Moment Correlation Analysis was used to analyze the relationship between Five Factor Personality Traits and Innovation Skills. Whether the five factor personality traits predict innovation skills at a significant level was analyzed by multiple regression analysis.

Findings

Table 1 displays the mean and standard deviation values of the scores obtained by students enrolled in Islamic Sciences Faculties on the Five-Factor Personality Traits scale. According to the research findings, the participant students obtained mean scores of 3.69 for extraversion, 3.91 for agreeableness, 3.91 for conscientiousness, 2.73 for neuroticism, and 3.80 for openness to experience. The analysis results indicate that personality traits related to agreeableness and conscientiousness are prominently displayed among students studying in Islamic Sciences faculties. The extraversion and openness to experience traits of the participant students are at a moderate level. Additionally, the students exhibit low levels of neuroticism.

Table 1. Descriptive Statistics Regarding the Five Factor Personality Traits of the Faculty of Islamic Sciences Students

| Personality Traits | N | Min. | Max. | \bar{X} | SD |
|------------------------|-----|------|------|-----------|------|
| Extraversion | 266 | 1.00 | 5.00 | 3.69 | 0.76 |
| Agreeableness | 266 | 1.60 | 5.00 | 3.91 | 0.62 |
| Conscientiousness | 266 | 1.20 | 5.00 | 3.91 | 0.63 |
| Neuroticism | 266 | 1.00 | 5.00 | 2.73 | 0.82 |
| Openness to experience | 266 | 1.57 | 5.00 | 3.80 | 0.62 |

Table 2 displays the mean and standard deviation values of the scores obtained by students enrolled in Islamic Sciences Faculties on the Innovation Skills scale. According to the research findings, the participant students obtained a mean score of 3.59 on the Innovation Skills scale. Based on this value, it can be stated that Islamic Sciences Faculty students have a moderate perception of innovation skills.

Table 2. Descriptive Statistics Regarding the Innovation Skills of the Students of the Faculty of Islamic Sciences

| | N | Min. | Max. | \bar{X} | SD |
|-------------------|-----|------|------|-----------|------|
| Innovation Skills | 266 | 1.00 | 5.00 | 3.59 | 0.81 |

As shown in Table 3, there were no significant differences in the average scores of extraversion, agreeableness, and openness to experience sub-dimensions of personality traits among students of Islamic Sciences Faculty in terms of gender variable ($p > .05$). However, there was a significant differentiation based on the gender variable in the sub-dimensions of emotional instability/neuroticism and self-discipline ($p < 0.05$). According to the mean scores, female students studying in Islamic Sciences Faculties have higher levels of self-discipline and neuroticism-based personality traits compared to their male peers.

Table 3. Comparison of the Five Factor Personality Traits of the Faculty of Islamic Sciences Students according to Gender Variable

| Personality Traits | Gender | N | \bar{X} | SD | t | p |
|------------------------|--------|-----|-----------|------|--------|-------|
| Extraversion | Female | 74 | 3.77 | 0.80 | 1.129 | 0.260 |
| | Male | 192 | 3.66 | 0.75 | | |
| Agreeableness | Female | 74 | 3.99 | 0.56 | 1.330 | 0.185 |
| | Male | 192 | 3.88 | 0.64 | | |
| Conscientiousness | Female | 74 | 4.09 | 0.63 | 2.853 | 0.005 |
| | Male | 192 | 3.84 | 0.61 | | |
| Neuroticism | Female | 74 | 2.89 | 0.86 | 1.975 | 0.049 |
| | Male | 192 | 2.67 | 0.80 | | |
| Openness to experience | Female | 74 | 3.79 | 0.61 | -0.157 | 0.875 |
| | Male | 192 | 3.80 | 0.63 | | |

Table 4 presents the results of the t-test conducted on innovation skills scores of students in Islamic Sciences

Faculty based on their gender. According to the analysis, there was a significant difference in innovation skills between male and female students ($p < 0.05$). Male students in the sample from Islamic Sciences Faculties were found to have a significantly higher perception of innovation skills.

Table 4. The Results of the t-test conducted on Innovation Skills Scores of Students in Islamic Sciences Faculty based on their Gender

| | Gender | N | \bar{X} | SD | t | p |
|-------------------|--------|-----|-----------|------|--------|-------|
| Innovation Skills | Female | 74 | 3.40 | 0.77 | -2.325 | 0.035 |
| | Male | 192 | 3.66 | 0.82 | | |

As shown in Table 5, there were no significant differences in the sub-dimensions of extraversion, agreeableness, conscientiousness, and openness to experience among students of the Faculty of Islamic Sciences in terms of age variable ($p > .05$). However, a significant difference was observed in the sub-dimension of emotional instability/neuroticism in terms of age variable ($p < 0.05$). According to the Tukey test analyses, students who have just started at the Faculty of Islamic Sciences (aged 18-20) have higher neuroticism characteristics compared to their older peers.

Table 5. Comparison of Five Factor Personality Traits of Faculty of Islamic Sciences Students according to Age

| Personality Traits | Age groups | N | \bar{X} | SD | F | p |
|------------------------|--------------|-----|-----------|------|-------|--------|
| Extraversion | 18-19 | 93 | 3.64 | 0.74 | 0.271 | 0.846 |
| | 20-21 | 97 | 3.73 | 0.76 | | |
| | 22-23 | 29 | 3.61 | 0.96 | | |
| | 24 and above | 27 | 3.68 | 0.76 | | |
| | Total | 266 | 3.69 | 0.76 | | |
| Agreeableness | 18-19 | 93 | 3.93 | 0.60 | 0.469 | 0.704 |
| | 20-21 | 97 | 3.89 | 0.62 | | |
| | 22-23 | 29 | 3.82 | 1.05 | | |
| | 24 and above | 27 | 4.14 | 0.61 | | |
| | Total | 266 | 3.91 | 0.62 | | |
| Conscientiousness | 18-19 | 93 | 3.90 | 0.62 | 0.090 | 0.966 |
| | 20-21 | 97 | 3.91 | 0.65 | | |
| | 22-23 | 29 | 4.00 | 0.57 | | |
| | 24 and above | 27 | 3.97 | 0.39 | | |
| | Total | 266 | 3.91 | 0.63 | | |
| Neuroticism | 18-19 | 93 | 2.95 | 0.85 | 2.494 | 0.043* |
| | 20-21 | 97 | 2.67 | 0.81 | | |
| | 22-23 | 29 | 2.60 | 0.58 | | |
| | 24 and above | 27 | 2.24 | 0.63 | | |
| | Total | 266 | 2.73 | 0.82 | | |
| Openness to experience | 18-19 | 93 | 3.81 | 0.61 | | |

| Personality Traits | Age groups | N | \bar{X} | SD | F | p |
|--------------------|--------------|-----|-----------|------|-------|-------|
| | 20-21 | 97 | 3.77 | 0.63 | 0.498 | 0.684 |
| | 22-23 | 29 | 3.78 | 0.71 | | |
| | 24 and above | 27 | 4.06 | 0.67 | | |
| | Total | 266 | 3.80 | 0.62 | | |

Table 6 presents the results of the F-test conducted on the innovation skills scores of the Faculty of Islamic Sciences students according to age groups. According to the analyses, there was no significant difference in innovation skills among students in different age groups ($p > 0.05$). The distribution of ages among the participants in the Faculty of Islamic Sciences did not lead to a significant difference in innovation skills.

Table 6. Comparison of Innovation Skills of Faculty of Islamic Sciences Students according to Age Variable

| | Age Groups | N | \bar{X} | SD | F | p |
|-------------------|--------------|-----|-----------|------|-------|-------|
| Innovation skills | 18-19 | 93 | 3.56 | 0.81 | 0.276 | 0.843 |
| | 20-21 | 97 | 3.62 | 0.81 | | |
| | 22-23 | 29 | 3.44 | 1.14 | | |
| | 24 and above | 27 | 3.43 | 0.44 | | |
| | Total | 266 | 3.59 | 0.81 | | |

Table 7 compares the personality traits of the Faculty of Islamic Sciences students according to the academic level. In terms of the variable of academic level, there were no significant differences in the mean scores of neuroticisms, conscientiousness, agreeableness, and openness to experience sub-dimensions of personality traits among students ($p > .05$). However, a significant difference was observed in the extraversion sub-dimension of personality traits according to the academic level ($p < 0.05$). Students studying at the postgraduate level showed higher extraversion traits compared to the undergraduate participants, according to the mean scores of the groups.

Table 7. Comparison of the Five Factor Personality Traits of the Faculty of Islamic Sciences Students according to the Level of Education

| Personality Traits | Degree | N | \bar{X} | SD | t | p |
|------------------------|---------------|-----|-----------|------|--------|--------|
| Extraversion | Undergraduate | 190 | 3.54 | 0.77 | -1.998 | 0.047* |
| | Graduate | 76 | 3.87 | 0.74 | | |
| Agreeableness | Undergraduate | 190 | 3.90 | 0.61 | -0.330 | 0.742 |
| | Graduate | 76 | 3.93 | 0.64 | | |
| Conscientiousness | Undergraduate | 190 | 3.86 | 0.66 | -1.667 | 0.097 |
| | Graduate | 76 | 3.99 | 0.56 | | |
| Neuroticism | Undergraduate | 190 | 2.81 | 0.86 | 1.798 | 0.073 |
| | Graduate | 76 | 2.62 | 0.75 | | |
| Openness to experience | Undergraduate | 190 | 3.77 | 0.64 | -0.974 | 0.331 |
| | Graduate | 76 | 3.84 | 0.59 | | |

Table 8 presents the results of the t-test conducted on the innovation skills scores of the Faculty of Islamic Sciences students according to the academic level. According to the analyses, there was a significant difference between undergraduate and postgraduate students in terms of innovation skills ($p < 0.05$). Participants studying at the postgraduate level showed significantly higher perception of innovation skills.

Table 8. Comparison of Innovation Skills of Faculty of Islamic Sciences Students according to Education

| | | Degree | | | | |
|-------------------|---------------|--------|-----------|------|-------|--------|
| | | N | \bar{X} | SD | t | p |
| Innovation skills | Undergraduate | 190 | 3.68 | 0.81 | 2.260 | 0.025* |
| | Graduate | 76 | 3.45 | 0.80 | | |

Table 9 shows the correlation coefficients between innovation skills and the personality traits that constitute the sub-dimensions of the Five-Factor Model of personality. According to the table, all personality traits showed a significant correlation with innovation skills ($p < 0.05$). However, when examining the direction of the relationship, neuroticism was negatively correlated with innovation skills, while the other personality dimensions showed a positive correlation.

Table 9. Correlation Coefficients of Five Factor Personality Traits and Innovation Skills

| | Innovation skills | |
|------------------------|-------------------|--------|
| | r | p |
| Extraversion | .303** | 0.000* |
| Agreeableness | .213** | 0.000* |
| Conscientiousness | .281** | 0.000* |
| Neuroticism | -.174** | 0.004* |
| Openness to experience | .397** | 0.000* |

Table 10 presents the results of the regression analysis on the prediction of innovation skills by the personality traits of the Faculty of Islamic Sciences students.

Table 10. Regression Analysis Results for the Prediction of Innovation Skills by Big Five Personality Traits of Faculty of Islamic Sciences Students

| | | Beta | t | p |
|-----------------------|------------------------|--------|--------|--------|
| (Constant) | | | 3.966 | 0.000* |
| Personality Traits | Extraversion | 0.103 | 1.438 | 0.152 |
| | Agreeableness | -0.019 | -0.269 | 0.788 |
| | Conscientiousness | 0.036 | 0.447 | 0.656 |
| | Neuroticism | -0.053 | -0.884 | 0.378 |
| | Openness to experience | 0.310 | 3.839 | 0.000* |

$R=0.411$; $R^2=0.169$; $F=10.585$; $p < 0.05$

The multiple regression analysis aimed to demonstrate the explanatory power of the variables of extraversion, neuroticism, conscientiousness, agreeableness, and openness to experience, which constitute the Five-Factor Model of personality. The analysis resulted in a single regression model. When examining the table, it can be observed that the personality traits explain approximately 16.9% of the variance in innovation skills. When looking at the standardized regression coefficients (β), it was found that openness to experience particularly positively predicted innovation skills.

Discussion and Conclusion

This study aims to examine the relationship between personality traits and innovation skills among students in the Faculty of Islamic Sciences. According to the findings, the participating students exhibit high levels of agreeableness and self-discipline dimensions. Extraversion and openness to experience traits are at moderate levels, while neuroticism is low. These findings are in line with previous research emphasizing the importance of traits in religious and relationship between personality traits and innovation skills (Mua'lim, 2022; Shalley, Zhou & Oldham, 2004; Liang, Chang, & Hsu, 2013). Alsager & Milton (2016); Halim & Chieng (2016); Gómez-Veiga, Vila Chaves, Duque and García Madruga (2018); Williamson & Anderson (2019) have shown that students' personality traits are strong predictors of their academic achievements in religious subjects. In this context, it is important for understanding the personality traits and innovation skills of students in the Faculty of Islamic Sciences.

The high levels of agreeableness and self-discipline dimensions indicate that these students have developed collaborative and adaptive abilities. This may enhance their potential for success in social relationships as they work in the field of Islamic Sciences. Self-discipline may reflect these students' ability to control themselves and achieve goals. This suggests that disciplined work and research skills can play a significant role in the success of Islamic Sciences students. The moderate levels of extraversion and openness to experience suggest that students in the Faculty of Islamic Sciences may be more accommodating and open-minded in social interactions (Amran, Nazri & Neliwati, 2022; Mua'lim, 2022). This may mean that they can more easily accept different ideas and perspectives. These traits can encourage students to engage in academic discussions and embrace new ideas. The low level of neuroticism indicates that students in the Faculty of Islamic Sciences possess emotional stability. This suggests that they have higher coping abilities with stress and emotional stability. It can enable them to focus calmly in study environments and work more efficiently.

Regarding the gender variable, analyses showed that the sub-dimensions of extraversion, agreeableness, and openness to experience did not significantly differ according to gender among students in the Faculty of Islamic Sciences. However, the variable of gender led to significant differentiation in the sub-dimensions of emotional instability/neuroticism and self-discipline. These findings align with previous studies reporting gender differences in personality traits, such as women generally scoring higher in neuroticism and men scoring higher in self-discipline (Amran, Nazri & Neliwati, 2022; Mua'lim, 2022; Camins, 2015; Meyer, Rose & Gordon, 2014). Interestingly, male students demonstrated a significantly higher perception of innovation skills. This discrepancy might be influenced by sociocultural factors and societal expectations that encourage males to engage in more

risk-taking and innovative behaviors (Serdyukov, 2017). These findings indicate that female students have higher personality traits based on self-discipline and emotional instability/neuroticism compared to their male peers.

In terms of innovation skills, significant differences were found among students in the Faculty of Islamic Sciences based on their gender. It was determined that male students have a significantly higher perception of innovation skills. This result indicates that male students tend to have more creative and innovative thinking and demonstrate their innovation skills to a greater extent (Serdyukov, 2017; Camins, 2015; Meyer, Rose & Gordon, 2014).

In terms of the age variable, analyses showed no significant differences in the sub-dimensions of extraversion, agreeableness, self-discipline, and openness to experience based on age. However, the age variable had a significant effect on the sub-dimension of emotional instability/neuroticism. It was found that newly enrolled students (18-20 age group) have higher neuroticism traits compared to their older peers. This finding may reflect the transitional phase from adolescence to young adulthood, characterized by increased emotional sensitivity and uncertainty (Goldburg, 2010; Amran, Nazri & Neliwati, 2022). This suggests that new students may experience more stress and anxiety during the adaptation process.

Regarding the educational level variable, analyses showed no significant differences in the sub-dimensions of neuroticism, self-discipline, agreeableness, and openness to experience based on the educational level. However, the educational level had a significant effect on the sub-dimension of extraversion. It was determined that graduate students exhibit higher extraversion traits compared to undergraduate participants. This is consistent with other research results in the literature (Nnorom, 2013; Akomolafe, 2013; Baht, 2016; Rani, 2017).

Finally, the relationship between innovation skills and the sub-dimensions of the five-factor personality model was examined. The findings indicate that all personality traits show a significant relationship with innovation skills. While there is an inverse relationship between neuroticism and innovation skills, the other personality dimensions (extraversion, agreeableness, conscientiousness, and openness to experience) exhibit a positive relationship. This suggests that innovation skills are associated with personality traits, particularly the dimension of openness to experience positively influencing innovation skills (Mua'lim, 2022; Thomas & Cassady, 2019; Treiber, 2010; Nighute, S., & Sadawarte, 2014).

In light of these findings, it can be stated that there are significant relationships between the personality traits and innovation skills of students in the Faculty of Islamic Sciences. Agreeableness and self-discipline dimensions are prominent factors in students' personality structures that support their innovation skills. These traits can be associated with factors that play an important role in the innovation process, such as the ability to collaborate, disciplined work habits, and problem-solving skills. Differences were observed in terms of gender and age variables. The higher self-discipline and neuroticism-based personality traits of female students indicate that they may be more disciplined and emotionally sensitive. On the other hand, the higher perceptions of innovation skills among male students suggest that males may exhibit a greater tendency for risk-taking, openness to novelty, and creativity.

In conclusion, there are significant relationships between the personality traits and innovation skills of students in the Faculty of Islamic Sciences. The duty and role of Islamic education, including responding to the opportunities and challenges of globalization, is to make fundamental Islamic values functional in a Muslim individual, as one of the functions of religious education in schools is to establish a moral foundation (Suyadi et al. 2022). It is known that; The Islamic religious education that took place up to now was no longer theoretical, and brought the religious skills of the students to the fore (Sabic, 2020). These findings indicate the need for educational programs and support services to be designed to enhance students' personality traits and innovation skills. Additionally, considering demographic factors such as gender and age is important to understand students' individual differences and needs.

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