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The Relative Contribution of Cognitive Agility in Predicting Mind Wandering in University Students

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Abstract

The study aimed to detect the level of cognitive agility and the level of mind wandering among King Khalid University students, as well as to find out the relative contribution of cognitive agility in predicting their mind wandering. The research sample consisted of (277) randomly selected female students from King Khalid University with an average age of (21.2) years and a standard deviation of (1.44). A measure of cognitive agility and mind wandering was applied to them. The results came to there are statistically significant differences at the level of (0.01) between the hypothetical mean of the scale and the average scores of the experimental sample for the total score on the mental wandering scale in favor of the sample scores. And The differences are significant and in favor of the hypothetical mean, meaning that the study sample has cognitive agility at an average level, but it does not rise to the required level. And there is a high predictive ability for digital readiness and cognitive agility to predict academic mind wandering among university students

Keywords: cognitive agility, mind wandering

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Introduction

The university stage is one of the most important stages in a student's life, as it aims to prepare the student to face the requirements of life in the future and represents his starting point towards his future to achieve his goals and ambitions. The university student is one of the important segments that bear a large part of the responsibility in preparing students to carry out their various roles to achieve the comprehensive development of society. Universities bear the largest share of responsibility in preparing students to carry out their various roles to achieve comprehensive development of society. Universities are entrusted with preparing a generation capable of cognitive openness, and therefore it was entrusted with trying to absorb and keep pace with cognitive developments, and move flexibly between cognitive openness and focusing attention and good awareness of its environment, which is called cognitive agility, which is one of the requirements of the era of globalization and the knowledge society. We cannot always build the future for youth, but we can build our youth for the future.

Cognitive agility is an effective element that contributes to addressing the problems facing students, whether inside or outside educational institutions, adapting to new information and scientific developments, and enabling them to master communication with others, negotiating to resolve conflicts, and reaching creative solutions to problems (Good, 2012).

Al-Feel, Helmy (2020) believes that cognitive agility increases the student's creative thinking skills, enables him to solve the problems he faces, increases his positivity and self-efficacy, enables him to control his way of thinking and mental orientation, improves his cognitive processing processes, and decision-making processes, and finally improves his academic achievement and increases his chances of academic success.

t is a proposed new structure that seeks to collect and develop the current keys to adaptive capacity (Good, 2009, p17), adaptive performance, and flexibility at the same time. Cognitive agility reflects the student's

ability to move easily back and forth between open-mindedness (Ross, Miller, Deuster, 2018) and focused attention. It is represented by a set of tools that the student uses, enabling him to perceive and shape his environment well when responding to ambiguous or unpredictable challenges, as well as when dealing with ambiguity (Vurdelja, 2011).

Cognitive agility also involves three dimensions: cognitive openness: represented by the breadth, depth, and exhaustion of awareness, and the frequent need to expand and experience experience; cognitive flexibility: represented by the ability to go beyond fixed, dominant, or automatic responses; and focused attention: represented by the student's ability to filter and filter information (Haupt, Kennedy, Buttrey, Alt, Mariscal, Fredrick, L ,2017,p.3) While cognitive agility consists of two distinct components: Differentiation refers to the ability to perceive multiple distinct characteristics and dimensions of a stimulus instead of perceiving only one dimension, and integration refers to the ability to identify multiple relationships between the distinct characteristics and dimensions of a stimulus (Choi & Coen, 2009).

Its importance appears especially in situations characterized by cognitive complexity (Lester & Kezar, 2012) and is evident in individuals through their metacognitive abilities, which are represented in understanding, monitoring, and organizing the use of flexible cognitive strategies in a way that helps and enables them to perform well (Knox, Lugo, Helkala, Sütterlin, Jøsok, 2018,p.541).

The researcher believes that the cognitive agility variable is still in the stage of exploration and research formation, as the research age of this variable in the world is a few years, so this variable began to be subjected to psychological and educational research within the limits of the researcher's knowledge in the year (2015) with the study (Adamo), which aimed to investigate the effect of cognitive agility on organizational commitment. The results of some very few studies on this variable revealed the existence of a statistically significant positive relationship between metacognitive strategies and cognitive agility (Knox, Lugo, Helkala, Sütterlin, Jøsok, 2018, p. 541) and the existence of a statistically significant positive relationship between levels of self-regulation and cognitive agility (Jøsok, Lugo, Knox, Sütterlin, Helkala, 2019). Improving cognitive agility according to (Hutton, Turner, 2019) requires approaches to improve all aspects of cognitive performance. For the student through training in “thinking techniques”, providing opportunities for feedback and collective information extraction, supporting learning through experience, encouraging self-reflection and the existence of a significant impact of cognitive agility in improving student performance in different learning environments, and its value increases in dynamic learning environments rich in information.

Cognitive Agility: The researcher defines it as “a multidimensional mental structure that combines cognitive openness, cognitive flexibility, and focus of attention. High levels of it increase the student’s performance in dynamic contexts rich with events. It is operationally defined as “the degree that the student obtains on the cognitive agility scale used in this research.” Cognitive agility - as a mental ability - is one of the most prominent mental abilities that are indispensable for today’s students because they live in a fast-paced, changing, renewable, and interconnected world. All of this requires that the student possess a sufficient amount of cognitive agility so that they can deal positively with the requirements of this world. The term cognitive agility appeared in 1991 in research work at the Lacocca Institute at The Hague University under the auspices of the American government. Then the terms administrative agility, organizational agility, manufacturing agility, strategic agility, and cognitive agility appeared, which are inferred by the degree of cognitive openness to demands and flexibility. Cognitive, as well as the extent of his attention in dynamic learning environments rich in events and overlapping stimuli.

Dynamic, information-rich learning environments require the ability to search for information, because constant attention to new information can lead to distraction. Focusing attention is vital in these environments, because the depth of information can be crucial to achieving the learning goals. When the context changes, too much focus can cause the student to miss important information. Therefore, the student must be able to use cognitive openness and focus flexibly according to the changing needs of the environment (Good, Yeganeh, 2012; Good, 2009).

And cognitive agility at.(Good, 2009, p. 15) is "a special cognitive ability that leads to increased performance in contexts that include a series of adaptation processes and reflects the student's adaptive behavior in dynamic contexts" and (Pisapia, 2009, p. 46) stated that it is the student's ability to adapt mentally quickly and efficiently to changes in his environment", and (Good, Yeganeh, 2012) defined it as the student's ability to work flexibly with cognitive openness and focus of attention", and finally (Hutton, Turner, 2019) defined it as the emerging product of the individual's ability to apply various knowledge, skills and abilities, required to make assessments and make quick judgments and decisions for a relative competitive advantage in anticipation of or in response to changes in the situation. Al-Feel, Helmy (2020) believes that cognitive agility is a multidimensional mental structure that combines cognitive openness, cognitive flexibility and focus of attention, high levels of which increase the student's performance in dynamic contexts rich in events, and that students differ in the amount of their agility Cognitive agility is a unique structure at the student cognitive level that is expected to lead the student to adaptive performance in a specific context of a dynamic task (Good, 2009, p. 19). Cognitive agility differs from cognitive adaptation in terms of the cognitive needs associated with a specific context in dynamic tasks in real time. The speed of change is also a necessary component provided by cognitive agility, which may not be required for adaptation or adaptive performance. Therefore, adaptation may allow the individual a longer time horizon. However, with the difference in the context of the task during its occurrence with the diversity and multiplicity of tasks, cognitive agility is required from the student. Cognitive agility also differs from cognitive flexibility. Although it means the student's ability to restructure and expand awareness and change, cognitive flexibility alone does not adequately describe what the student actually changes about his awareness or knowledge, as the change is related to specific environmental contexts (Good, 2009, p. 17-18).

Cognitive agility has three dimensions: 1- Cognitive Openness: Cognitive openness in psychological literature is associated with many terms such as: creativity, openness to experience, curiosity, and mental alertness. It refers to the acceptance of new ideas, experiences, and perspectives, and is represented in the breadth, depth, and exhaustion of awareness, and in the frequent need to expand and experience experience and the desire to engage in exploratory behavior, which results in the acquisition of new knowledge. (McCrae & Costa, 1997, p. 826; Haupt, Kennedy, Buttrey al, Alt, Mariscal, Fredrick, 2017, p. 3; Collins; Litman & Spielberger, 2004; Bodner & Langer, 2001) Individuals who are cognitively open are characterized by non-routine interest, and they are comfortable with ambiguity, and they accept new ideas, experiences, dimensions, and visions, and they tend to like intellectual problems, and they seek novelty and explore new creative solutions; all of this makes them adapt appropriately to changing circumstances. (LePine, Colquitt & Erez, 2000) ;Blickle,1996; Haupt, Kennedy, Buttrey, Alt, Mariscal & Fredrick,2017,p.3) .Characteristics of open-minded individuals • Belief in the relativity of scientific facts • Openness to new ideas and experiences, and examining the various alternatives proposed, to reach appropriate solutions to problems. • Not rushing to conclusions or being strict with them • Not issuing absolute or final judgments • Accepting constructive criticism and benefiting from it. • Respecting diversity of ideas • Following scientific developments and innovations and absorbing them • Trying new methods and techniques. (Abdul Muttalib Amin, 2005, 33-34) The student's ability to seek knowledge of new ideas and experiences, and to process the ideas received in a neutral manner without any bias, accepting criticism and not rushing to issue judgments or make decisions, and the ability to learn from different points of view2- Cognitive Flexibility: Cognitive flexibility refers to the ability to quickly reconfigure the mind when moving between different tasks. (Braem, Egner,2018,p.2) It is also "the ability to control, transform and overcome fixed, dominant or automatic responses (Haupt, Kennedy, Buttrey, Alt, Mariscal, Fredrick,2017,p.3) Cognitive flexibility is also crystallized in the ability to change behavioral strategies when the environment changes. Al-Feel Helmy (2014, 2066) defined it as "a higher mental ability that enables the student to dynamically modify his cognitive structure to produce new, multiple and non-automatic responses that enable him to adapt to the changing demands of his environment and he stated ((Dennis, Vander, Wall, 2009, p250 Cognitive flexibility consists of the student's ability to perceive and control difficult situations, and the student's ability to provide multiple alternative explanations and solutions to difficult situations 3- Focused Attention: Attention is defined as "the appropriate allocation of processing resources to relevant stimuli

(Coull, 1998, p344). There are some terms associated with focused attention, including: Selective Attention and Sustained Attention. Focused attention is a general and comprehensive.

Manifestations of cognitive agility (Afaf Saeed, 2021, 210) extracted the characteristics of people with cognitive agility, which were represented in the following: - The ability to maintain focus. - Enjoy increased emotional intelligence. - Enhance personal communication skills. - The ability to exploit new opportunities. - The ability to use perceptions, experiences, and make judgments about what happened in the past and is happening in the present to help guide future decisions. - More capable of differentiation and integration. Differentiation means the ability to perceive multiple dimensions instead of just one dimension, while integration means the ability to identify relationships between the different characteristics of situations. - More capable of seeing others from a contradictory perspective, and better able to comprehend contradictions, which is an indicator of social perception skills that enable them to interact skillfully with others. The importance of cognitive agility: Cognitive agility increases the student's creative thinking skills, enables him to solve the problems he faces, increases his positivity and self-efficacy, and enables him to control his way of thinking and mental orientation, which makes the student specific in his thinking steps, improves his cognitive processing and decision-making processes, increases his determination and perseverance, improves his academic achievement and thus increases his chances of academic success, while reducing the amount of cognitive biases he has. (Helmy Muhammad, 660, 2020).

The learner must be highly attentive and focused on the tasks and activities he performs; so that his mind does not wander away from those tasks in light of the digital transformation, digital dominance, the e-learning environment, and the developments of the current century. This is known as mental wandering. The term mental wandering is one of the modern terms in the field of education and psychology, and it means shifting attention away from the primary task (Dibbies & Jolles, 2006, 69). Mental wandering occurs in our daily lives automatically while engaging in various life activities, as the mind is distracted from the task assigned to it. The learner during his school day and while performing various educational activities, especially computer activities, may be distracted from the task assigned to him; which affects the success and completion of that task and the achievement of the desired educational goals (Pachai et al. 2016). Therefore, these common approaches between them draw attention to the assumption that both cognitive agility and mental wandering can contribute to predicting the learner's performance. In light of the digital transformation, educational institutions are calling for development in the method of presenting information to students. With the increasing desire to use modern technology in teaching, this has led to the necessity of introducing modern strategies that open new horizons for thinking and motivation towards learning. The digital transformation leads to reliance on research, cognitive openness, understanding, linking new knowledge with the learner's previous experiences, and innovation. When looking at the traditional methods used in teaching, we find that they do not keep pace with modern technological changes and with the capabilities of students. The student no longer needs indoctrination, but rather needs to discover and acquire information on his own to have flexibility in cognitive processing of information, raise the level of achievement, reduce mental wandering, and benefit from what the learner studies and its connection to reality in the e-learning environment. (Young, W, et al.2022)

The study (Moore & P, Malinowski, 2009A) aimed to identify the relationship between meditation, mindfulness, and cognitive agility. The study sample consisted of 10 individuals. The agility scale he prepared and the Kentucky Mindfulness Scale were used. The results showed that attention performance and cognitive agility are positively correlated with meditation practice. It also concluded that mindfulness has a close relationship with improving attention functions and cognitive agility. The study (Helmy Mohamed El-Feel 0303,) aimed to identify the effectiveness of the challenge-based learning model in improving the development mindset and cognitive agility, as well as to reveal the degree of difference in the effectiveness of the challenge-based learning model in improving the development mindset and cognitive agility among students of the Faculty of Specific Education, Alexandria University, according to the gender variable (male/female). This research was applied to a sample of (60) male and female students in the fourth year at the Faculty of Specific Education, Alexandria University. The researcher used the development mindset scale and the cognitive agility scale he prepared, and the test Raven's Colored

Progressive Matrices (standardized by Imad Ahmed Hassan, 20306), and the enrichment program based on the challenge-based learning model prepared by him. The research results revealed the existence of statistically significant differences between the average scores of the students of the experimental and control groups in the post-measurement of the development mindset and cognitive agility in favor of the experimental group students, and the existence of statistically significant differences between the average scores of the students of the experimental group in the pre- and post-measurements of the development mindset and cognitive agility in favor of the post-measurement, while there were no statistically significant differences according to the gender variable (male/female).

The study of (Afaf Saeed Farag 0300) also addressed the effectiveness of a training program based on the theory of experiential learning in academic integration and cognitive agility among female students of the Faculty of Humanities in Tefna Al-Ashraf, Dakahlia, Al-Azhar University. The sample consisted of (60) female students who were divided into two groups, one experimental and the other control. The scales of academic integration and cognitive agility, the scale of the effectiveness of experimental treatment, and training sessions based on experiential learning were used. The results showed the effectiveness of the training program, as the differences between the pre- and post-measurements were in favor of the post-measurement, and between the pre- and follow-up in favor of the follow-up, while no differences appeared between the post- and follow-up measurements. The study of (Mohamed Abdel Raouf 0300) was conducted on a basic sample of (004) male and female teachers specializing in (science and mathematics) in the preparatory and secondary stages with an average age of (02000) The study aimed to reveal their levels of cognitive agility, and the differences between them due to gender, specialization, and age, and the role that these differences play in the speed and accuracy of their responses to negative feedback (positive and negative) while performing a computer task that simulates the dynamics of decision-making in the original learning environment in which they work. The study relied on two tools: The scale (prepared by the researcher) consists of (03) situations to measure the level of cognitive agility, and an updated computer version of the Flanker task originally prepared by Eriksen & Eriksen (1974) (but intended for adults). The results indicated that the sample members had varying levels of cognitive agility despite their overall appearance of (average) results, and that there were differences between them in the level of cognitive agility (dimensions, and total score) due to gender, specialization, and age, and that there were statistically significant differences between those with high and low cognitive agility in the speed and accuracy of responding to feedback (positive and negative).

Mind wandering is one of the most important internal sources of distraction for the learner that hinders his learning in academic situations. Digital media is also one of the most important external sources of distraction for the student during learning, which has become a prominent problem recently. The majority of teachers reported that digital media greatly distract students and interfere with learning (Rosen, 2017; Aagaard, 2015). Mind wandering is a general human phenomenon that takes up space from the task and focuses on internal thoughts and mental images that are not related to the task or the current targeted situation (Shalaby and Ayed, 5.50). Mind wandering is defined as thoughts that are generated independently and have no relation to the main task and occur during a task or activity that the individual is performing (Ostojic, 2018). The phenomenon of mind wandering has imposed itself strongly on the educational research table in the field of learning due to its negative effects on the student's learning process, their integration and academic achievement, as mind wandering occurs during learning activities at varying rates ranging between (5% - 0.-%), which negatively affects the student's integration in the learning process and thus reduces learning outcomes. The results of recent studies indicate that the majority of students frequently wander to a large extent, and that it is the most powerful influence on concentration during study. The negative impact of mental wandering is difficult to limit (Marazeke et al., 2020). What makes the matter more complicated is that it cannot be observed by teachers (Smallwood & Schooler, 2015). Mental wandering affects educational phenomena and cognitive variables in any educational situation, as it works to change the student's thinking and makes him think about things that are not related to the current task, as it works to separate attention from external stimuli to internal thoughts (Wadaa, 5.5). Mental wandering also affects "through.

Smallwood and Schooler (2006) see mind wandering as the interruption or cessation of focus on a task by task-unrelated thinking. It refers to the failure to maintain focus on the thoughts and activities of the primary task as a result of an automatic shift of attention from the primary task to internally generated thoughts. There are two main types of mind wandering: intentional, which refers to internal, self-generated thoughts that occur intentionally or deliberately, such as planning a party list while driving. Unintentional/automatic mind wandering occurs when the mind drifts, for example, during a lecture or conversation. (Mowlem, F.D., et al., 2016) The thoughts that represent the content of mind wandering are classified into: 1- Task-irrelevant thoughts: These are thoughts that are not related to the current task, such as: completing this task, personal interests, fears, internally generated stimuli, and daydreaming. 2- Task-interfering thoughts: These are thoughts that cause distraction from performing the task, and this distraction may be positive or negative (Al-Feel, 2018). Regardless of the widespread nature of mind wandering, individuals differ in the frequency and intentionality of mind wandering, and highly automatic/spontaneous mind wandering is associated with dysfunction and psychological disorders such as attention deficit hyperactivity disorder (ADHD). (Franklin et al., 2014) In mind wandering, the majority of attentional resources are directed to thoughts that are not related to the task, or the procedural control function is not successfully accomplished (Wang et al., 2017). Mind wandering results in part from a failure in executive control rather than from a scarcity of executive resources. When executive control fails to suppress various spontaneously generated thoughts, mind wandering occurs (McVay & Kane, 2010). Smallwood & Schooler (2006) hypothesize that during mind wandering, executive/procedural control becomes disengaged from the current task and shifts toward processing internal information (e.g., memories). Recent studies confirm the strong association between mind wandering and working memory capacity. The results of a study by Levinson, Smallwood & Davidson (2012) indicated that individuals with high memory capacity are more likely to mind wander than those with limited working memory capacity. The results of studies by(Seli et al; Meier, 2011).

The phenomenon of mind wandering is currently receiving attention from researchers in the field of learning due to its negative effects on the process of students' learning, their integration and academic achievement, despite its positive impact on some aspects such as creative thinking. Mind wandering occurs during learning activities at varying rates ranging between (20% - 40%), which negatively affects students' integration in the learning process and thus reduces learning outcomes. (Mills, DMello, Bosch & Olney, 2011) During students' learning of academic subjects, two types of mind wandering can be distinguished: 1- Mind wandering related to the academic subject: It is a forced interruption in attention to ideas that are not related to the current task but are related to the topics of the academic subject and that occur automatically. 2- Mind wandering not related to the academic subject: It is a forced interruption in attention to ideas that are not related to the current task and are not related to the topics of the academic subject but occur automatically (Al-Feel, 2018). Therefore, researchers sought to study the relationship between mental wandering and variables that can reduce mental wandering, as mental wandering represents an obstacle to effective learning. The results of studies have shown that mental wandering reduces students' ability to solve problems and lowers students' academic performance. A negative effect of mental wandering was also found on reading comprehension skills, and a negative correlation with academic achievement, with mental wandering being positively associated with stress and bad mood among students. (Oettingen & Schworer, 2013; Lindquist & McLean, 2011; Mrazek, et al. 2013; Mills, et al. 2011) Some recent studies, such as (Al-Feel, 2018; Al-Omari and Al-Basel, 2019), aimed to build programs to reduce mental wandering among university students as a characteristic that negatively affects learning outcomes. In this regard, studies have shown that the learner's mental alertness reduces the negative impact of mental wandering on the learning process by developing his continuous attention, and it may also reduce the learner's negative emotions that may be a source of mental wandering (Al-Feel, 2018, p. 9). The results of the study (Mrazek, et al., 2014) also showed that training in mental alertness reduces mental wandering and improves cognitive performance.

Hollis (2013) study revealed the predictive ability of mental wandering in academic performance and interest in the subject matter. The study sample consisted of (26) university students. The results of the

study revealed the possibility of significant prediction of academic performance and the degree of interest in the subject matter through the degree of mental wandering among university students.

Randall's study (2015) aimed to identify the effect of self-regulation in reducing mental wandering as well as the relationship between mental wandering and learning outcomes in a self-regulated learning environment. The study was conducted on a sample of (133) university students. The results of the study showed that there is a significant effect of self-regulation in reducing the degree of mental wandering as well as a negative and significant correlation between mental wandering and learning outcomes.

The study (2017) Rahl, Lindsay, Pacilio, Brown Creswell aimed to verify the effect of mindfulness training in reducing mind wandering in a sample of (147) university students (74 male students / 73 female students) who were randomly distributed into three groups, each group received a different type of training on (mindfulness, relaxation, task acceptance). The results showed a significant effect of mindfulness training in reducing mind wandering.

The study (Wessam Hamdy Abdel Samee 0300) also aimed to identify the effect of using attention training technology in reducing mind wandering during e-learning among university students, in addition to determining the extent to which the effect of short-term targeted attention training transfers to the student's academic integration during the e-learning process. The study sample consisted of (10) male and female university students who were randomly distributed equally into the experimental and control groups. The researcher used the tools of the mind wandering scale, the academic integration scale during e-learning prepared by the researcher, the attention control scale (translated by the researcher), and attention training tasks, which include three tasks: the selective attention task, the attention shifting task, and the distributed attention task. The results of the study showed that there were statistically significant differences between the average scores of the experimental group and the control group in the post-measurement of mind wandering in the direction of the control group, and there were statistically significant differences between the average scores of the experimental group and the control group in the post-measurement of mind wandering in the direction of the control group. The pre- and post-measurements of the experimental group in mental wandering were in the direction of the pre-Experimental, which means that there is a statistically significant effect of attention training in improving the student's academic engagement during e-learning. measurement, and this result indicates the effectiveness of attention training in reducing mental wandering in the experimental group.

Marwa et al. (2022) aims to identify the effectiveness of a program based on the inquiry and context-based learning approach, with the aim of developing achievement, improving cognitive agility and functional mental wandering, and reducing non-functional wandering among second-year preparatory school students in an e-learning environment. The program was prepared using the steps of the inquiry and context-based learning approach to teach the "Website Design" unit. An achievement test was also prepared to measure the cognitive aspect, and a scale of cognitive agility and mental wandering, all of which were prepared by the researchers. The research sample consisted of second-year preparatory school students in a school in Dakahlia Governorate. The quasi-experimental approach was followed with an experimental design for two equal groups, one of which was experimental, numbering (30) students, who were taught using the electronic program, and the other was a control group, numbering (30) students, who were taught using the traditional method. The research tools were applied to the students of the two groups (before and after). The research results showed the effectiveness of the electronic program in improving achievement, cognitive agility, and mental wandering among students.

Research question

Q1-What is the level of cognitive agility among King Khalid University students.

Q2- What is the level of mind wandering among King Khalid University students.

Q3-does the relative contribution of cognitive agility in predicting mind wandering among students of King Khalid University

Aimes of Research:

The current Research aimed to :

1- Identifying the level of cognitive agility among King Khalid University students

2- Identifying the level of mind wandering among King Khalid University students

3- revealing the relative contribution of cognitive agility in predicting mind wandering among students of King Khalid University

Research Hypothesis:

In the light of the results of previous studies, the research hypotheses can be formulated as follows:

1 -There is no statistically significant differences between the hypothetical mean and the mean sample scores on the cognitive agility scale among students of King Khalid University.

2- There is no statistically significant differences between the hypothetical mean and the mean sample scores on the mind wandering scale among students of King Khalid University.

3-the relative contribution of cognitive agility in predicting mind wandering among students of King Khalid University.

Methods:

Participants:

The research sample included two samples: the sample of psychometric efficiency of the tools and the basic research sample. The number of the psychometric efficiency sample was (83: 43 male students / 40 female students) who were randomly selected from students of the College of Education for Boys and Girls at King Khalid University in Abha. Their average age was (21.71) with a standard deviation of (1.58). The basic research sample consisted of (277) with (145 male students, 132 female students) who were randomly selected from students of the College of Education for Girls at King Khalid University in Abha, and the College of Education for Boys at King Khalid University in Abha, in the departments of Psychology, Special Education and Sharia, at levels (fourth, fifth, sixth and seventh). Their average age was (21.2) with a standard deviation of (1.44).

Measurers:

The research tools included: 1- cognitive agility scale: 2- Cognitive failure scale, the following is a detailed presentation of these tools and their psychometric characteristics

Measurers: The research tools included: 1- Academic emotion scale: 2- mind wandering scale, the following is a detailed presentation of these tools and their psychometric characteristics

1-Mental wandering scale: (prepared by the researchers)

The current researchers built the mental wandering scale in light of the theoretical framework of mental wandering and its dimensions, in addition to reviewing the Elephant scale (2018), the Mrazek, et al. (2013) scale, the Sulivan scale (2016), and the Gray scale (2016) to measure mental wandering. Description of the scale: The scale in its final form consists of (20) statements, and the statements are corrected in light of a four-point scale (always, often, sometimes, rarely), and a total score for the scale is obtained that represents the degree of mental wandering, and a high score indicates a high degree of mental wandering in the individual.

Psychometric properties of the scale:

Validity of the scale:

- **Validity of the hypothetical structure**: The correlation coefficient was calculated between the phrase score and the total score on the scale after deleting the phrase score, and the values of the correlation coefficients ranged between (0.61 to 0.79) and they were all statistically significant at (0.01) - Factorial validity: To ensure the factorial validity of the scale, an exploratory factorial analysis of the scale phrases was conducted using the basic components method, and the Clifford criterion was used to determine the factors. The factorial analysis resulted in the extraction of a general factor on which all the scale phrases were significantly saturated, and the value of the latent root for this factor was (10.54) and the percentage of its factorial variance was (52.71%). This factor can be called the mental wandering factor.

The confirmatory factor model was also tested, which consists of 20 independent variables (scale statements), with one latent variable (mental wandering). The proposed model was tested with one latent variable, and the values of the goodness-of-fit indices were in the ideal range: the value of Chi2 was not statistically significant, and the ratio of Chi2 to the degree of freedom was (1.68), which is less than the value (2), and the value of the RMSEA index was less than (0.06), and the value of GFI = 0.98, which indicates that the proposed measurement model is consistent with the empirical data of the sample.

Scale reliability: - The reliability of the scale was verified by calculating the alpha-Cronbach stability coefficient, where its value reached (0.95) - The reliability of the scale was also verified by split-half using the Spearman-Brae equation, The totall reliability coefficient of the scale reached (0.93).

2- Cognitive agility scale:

The researcher prepared a measure of cognitive agility for university students. The measure consists of (18) items and includes three dimensions in which the items are distributed as follows: cognitive openness, which includes items (1-6); Cognitive flexibility includes vocabulary (7-13); Focusing attention and including vocabulary (14-18), The researcher evaluated the response to the scale items using a five-point rating scale as follows (to a very large degree - to a large degree - to a moderate degree - to a low degree - to a very low degree), and the scale is corrected as follows in the order of the previous responses (5-4-3-2-1) Degree.

The researcher calculated the correlation coefficient between each item of the scale and the dimension to which it belongs to verify the internal consistency of the scale, and calculated the correlation coefficient between each item in the scale and the dimension to which it belongs to verify the internal consistency of the scale, and the correlation coefficients ranged between (0. 0,484-0.851). All of them are statistically significant correlation coefficients at the significance level (0.01), which confirms the internal consistency of the scale.

The researcher calculated the differences between the lowest and highest quartiles in students' scores on the scale, and there were statistically significant differences between the lowest and highest quartiles on the digital readiness scale, where the Z value for the dimensions of the scale ranged between (2.912 - 3.401), and it also reached (3.373) for the scale as a whole, and all values were statistically significant at the significance level (0.01), which indicates the validity of the scale.

The researcher verified the stability of the scale by finding Cronbach's alpha coefficient. and The results are proven that the scale has a high level of reliability, as the Cronbach's alpha reliability coefficients ranged between (0.786-0.956), which are high and acceptable values; and the test-retest method was used to verify the stability of the scale and the correlation coefficients between the first and second applications of the scale are all statistically significant at the level of (0.01). Which indicates the stability of the scale.

Search results:

Result of H1:

It states that: There is no statistically significant differences between the hypothetical mean and the experimental mean scores of the sample on the mind wandering scale among King Khalid University students"

To test the validity of this hypothesis, the mean and standard deviations of the scores of the respondents were calculated on the mind wandering scale and the hypothetical mean was calculated on the scale itself

The "T" test was used for one sample to verify the significance of the differences between the hypothetical mean and the experimental mean on the mind wandering scale, and table (1) shows the results of this

table (1) The results of the "T" test of one sample for the differences between the score of the experimental average and the hypothetical average on the mind wandering scale (n=277)

experimental mean	standard deviation	hypothetical mean	T	df	sig	level
61.55	17.36	50	11.17	276	0.01	high

The results in Table (1) show that there are statistically significant differences at the level of (0.01) between the hypothetical mean of the scale and the average scores of the experimental sample for the total score on the mental wandering scale in favor of the sample scores. The weighted mean value of the sample scores reached (3.07). These results indicate that the first hypothesis of the current study was not achieved and the alternative hypothesis was accepted. From the previous presentation of the results of the first hypothesis, it is clear that there is a high level of mental wandering among the sample members. This result is consistent with the results of the study (Risko et al., 2012), which showed a high level of mental wandering during lectures. The high level of mind wandering among students during learning can be attributed to students' involvement and drift in self-generated intellectual paths and internal ideas that are not related to learning tasks, which leads to their disconnection from the outside world as a result of their feeling bored or hopeless during learning (negative emotions) in addition to the lack of motivation to learn. Students also direct most of their attentional resources to ideas and stimuli that are more attractive to them than learning tasks, especially in light of the development of technology and social media, which has resulted in a huge momentum of distracting stimuli that work to divert attention from learning tasks to those stimuli that are considered more attractive and enjoyable for them compared to learning stimuli. The increased level of mind wandering can also be attributed to the decrease in the level of executive/procedural control so that it becomes disengaged from the current task and moves towards processing internal information (such as memories).

Result of H2:

It states that: There is no statistically significant differences between the hypothetical mean and the experimental mean scores of the sample on the Cognitive agility scale among King Khalid University students"

To test the validity of this hypothesis, the mean and standard deviations of the scores of the respondents were calculated on the Cognitive agility scale and the hypothetical mean was calculated on the scale itself

The "T" test was used for one sample to verify the significance of the differences between the hypothetical mean and the experimental mean on the Cognitive agility scale, and table (2) shows the results of this

table (2) The results of the "T" test of one sample for the differences between the score of the experimental average and the hypothetical average on the Cognitive agility scale (n=277)

experimental mean	standard deviation	hypothetical mean	T	df	sig	level
56	14.2	54	15.7	276	0.01	average

The results in Table (2) show that The differences are significant and in favor of the hypothetical mean, meaning that the study sample has cognitive agility at an average level, but it does not rise to the required level.

In addition, if the sample members have differences in the level of the basic components of cognitive agility, then they will undoubtedly also differ in their ability to achieve consistency and coordination between the functions of these components, and thus this will be reflected in the outcome of cognitive agility, and deviations may occur in it to the same extent as the lack of balance between the three components of cognitive agility in the individual, and this is what made the performance of the sample members appear with this average degree of cognitive agility.

Result of H3:

It states that: the relative contribution of cognitive agility in predicting mind wandering among students of King Khalid University.

To verify the third hypothesis of the research .The researcher verified the predictive value using multiple linear regression analysis Table (3) shows the results.

Table (3) Results of multiple linear regression analysis

VIF	Sig T	T	B	Sig F	F	R^2	R	Variables
1.630	0.01	-26.74	0.89-	0.01	872.23	0.830	0.913	**Cognitive agility**

Table (3) shows that the value of (F) of (872.23) is statistically significant at (0.01) and the value of significance is smaller than the value of (0.01) which is significant. Also, the value of the coefficient of determination (R2) for the (Cognitive agility) is reached (0.830), meaning that the explanatory variable explains (83%) of the dependent variable (mind wandring), and the value of the value of (B) was (0.89) for cognitive agility, which is statistically significant by looking at the value of (T), where its value is (26.744).

From the above, it is clear that the third and fourth hypothesis are correct, which indicate that there is a high predictive ability for digital readiness and cognitive agility to predict academic mind wandering among university students. The results of the current research are consistent with the study of Smallwood and Schooler (2006) see mind wandering as the interruption or cessation of focus on a task by task-unrelated thinking. It refers to the failure to maintain focus on the thoughts and activities of the primary task as a result of an automatic shift of attention from the primary task to internally generated thoughts. There are two main types of mind wandering: intentional, which refers to internal, self-generated thoughts that occur intentionally or deliberately, such as planning a party list while driving. Unintentional/automatic mind wandering occurs when the mind drifts, for example, during a lecture or conversation. (Mowlem, F.D., et al., 2016).and The results of the current research are consistent with the study of Abdel Aziz (2022)

Conclusion and Recommendations:

Based on the results of the current research, the following can be recommended: Necessity to Working to develop digital readiness and cognitive agility among university students for its effective role in supporting academic well-being; Providing programs that aim to develop academic well-being among university students

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