



Antecedents to academic success in higher education institutions: The case of UAE University

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Received: 20 February 2019 / Accepted: 4 October 2019 / Published online: 16 November 2019
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Abstract

This research develops a model to investigate the influence of different determinants on student's Academic Performance (AP) in UAE University (UAEU). The model consists of Big Five personality traits (BigF) and other learning-orientation strategies. The importance of this research to the UAE's context stems from the fact that determinants of AP vary from one country to another and hence, UAE students may possess different personal traits and learning strategies. From 179 legible responses, the proposed model showed its success in detecting AP of UAEU students with the BigF attributes being the main contributors to explaining AP. The research showcases interesting insights and implications pertaining to UAEU-student's learning strategies, traits and habits. The implications point to different theoretical and professional contributions and contentions and hence, suggesting different recommendations.

Keywords Learning orientations · Big five · Academic performance · UAE · Higher education

1 Introduction

In relation to learning structure, culture and agency, Case (2015) found student learning research is outdated and called for new theoretical and methodological approaches. She contended that the focus should be on students 'being' and 'becoming' rather than just on knowledge and skills. At the outset, Zeegers (2004: 35) found that "learning is a complex human activity and one not easy to conceptualize by means of a simple model. The factors that can impact on students' success in higher education are manifold, but they are sometimes categorized as being either personological factors (e.g. age, prior experiences, learning styles) or contextual factors (e.g. teaching and learning activities,

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assessment procedures)”. By focusing here at the personological level, one stream of research argues that students using cognitive strategies and organizing at a high level, would have a direct impact on their academic achievements/performance (AP) (Ersözülü 2010). It also endorses the notion that students need to develop sound strategies to increase their learning in order to excel (Zimmerman 1994) and to be independent learners (Ersözülü 2010). Cabi and Yalcinalp (2012) highlighted that students’ success is contingent upon knowing about their own preferred styles and learning strategies. In discussing the existing link between learning experience and study behavior, Ning and Downing (2011) found previous research arguing that effective learning (active learning by Zimmerman 2008) happens when: students possess adequate study skills, positive attitude, and considerable motivation and self-regulation and when students’ learning experience as subjected to different teaching and learning environments enables them master different study approaches. Zimmerman (2008) highlighted that study behavior is a function of study skills, study attitude and motivation where study attitude represents as interest in learning which in turn relates to student’s motivation and their use of self-regulatory strategies.

Fook and Sidhu (2015) investigated learning challenges confronting students in higher education and reported the following challenges: burden of assignments, becoming an active learner, cognitive challenge, instructional problems, coping with reading materials, language barrier, culture difference in higher education and time management. Lynn (2009) found the literature reporting different implications: meeting the diverse needs of different higher-education by teachers; and infusing technology in education did contribute but slightly as students’ individual differences and their learning needs should take precedence. Therefore, it is important to know what drives learning and students’ AP.

Emanating from the above perspectives, Case (2015) drew a social realist perspective on student learning in higher education and raised the importance of understanding the personal and social identity of students. Similarly, John and Srivastava’s (2001) raised the importance of personality to identify individual differences in behavior and experience. They concluded by supporting the Big Five (BigF) taxonomy as an “integrative function” due to its power in capturing personality description through a common framework. The BigF has been found to heavily replicate across large range of human societies and contexts that goes beyond language and other cultural differences (Gurven et al. 2013). The BigF are five important factors (extraversion, agreeableness, conscientiousness, neuroticism, and Intellect/openness) that are used to describe human personality and behavior and could capture most of individual’s daily differences in behavioral patterns and AP in many domains (Babakhani 2014; Costa and McCrae 1992; De Feyter et al. 2012; Graham 2006; Kinga et al. 2012; Lynn 2009). On their review of the literature, Zhang and Ziegler (2016) noted that there is a considerable amount of cognitive, personality and other traits that contribute to student performance, but meta-analysis have always shown that the BigF Model (In particular: Openness and Conscientiousness; Conscientiousness were the most significant predictors of AP in secondary and tertiary education followed by openness) contribute to the prediction of student AP way above and beyond intelligence.

However, despite the existing consensus about the strength of the BigF in detecting personality traits, other researchers criticized the BigF (Barbaranelli et al. 2003; John and Srivastava 2001; Wolters 1999) as lacking a common framework to interpret results

and as conflicting on the nature and the number of measures needed to elicit personality (Barbaranelli et al. 2003). Thus, the implications here are fivefold. Initially, the underlying processes concerning the different theories (predictors of learning) are still unclear (Zhang and Ziegler 2016). Secondly, prior studies have mostly been conducted in Western culture and hence, little is known about these effects in non-Western cultures (Zhang and Ziegler 2016) or indigenous (Gurven et al. 2013). Thirdly, the BigF and its impact on AP seemed to be subject-specific where for example, conscientiousness and neuroticism were found to be important predictors of AP in mathematics and extraversion in learning languages, etc. (Zhang and Ziegler 2016). There are significant differences in findings across etic and emic BigF studies (Gurven et al. 2013). Fourthly, other researchers accused the BigF of not representing a theoretical perspective per se and rather, it is derived from analysis of natural-language terms that people use to describe themselves and others (John and Srivastava 2001). Finally, researchers highlighted that personality traits are as highly relevant predictor of AP as cognitive abilities but the importance of abilities stem from what we do with them (Vedel 2014). Ibrahim et al. (2014) on the other hand, found that the literature reporting the positive significant correlation between cognitive ability like student's attitude and motivation on AP, but this factor alone is not enough to fully predict AP. Accordingly, the same literature raised the importance of including non-cognitive predictors of AP such as the BigF.

Therefore, we could not rely on either the BigF alone or the cognitive abilities as the only predictors of AP. Indeed, different researchers used the BigF factors simultaneously as predictors of AP and of externalizing and internalizing problematic behavior syndromes (Barbaranelli et al. 2003). Omar et al. (2015) found the literature reporting that what influences student performance in learning are factors such as student learning styles, home background, learning environment, government policies, family background, school environment and teacher-related factors. McKenzie et al. (2004) investigated the impact of previous AP, achievement motivation, self-regulatory learning strategies, and personality traits and found previous high AP, use of self-regulatory learning strategies, and being introverted and agreeable impacting academic success. Achievement motivation and conscientiousness indirectly influenced academic success through the influence they had on the students' use of self-regulatory learning strategies. In the same vein, Komaraju et al. (2011) found in addition to personality, learning styles (unique approaches of thinking, processing information, and acquiring knowledge) were used to predict AP. They found many learning styles such as synthesis-analysis, elaborative processing, methodical study, fact retention, etc.

Thus, this research will extend the BigF with other learning drivers to shed more light onto what drives AP amongst UAE University (UAEU) students. Accordingly, by answering: *how might we enhance learning amongst UAEU students*, this research attempts to identify different cognitive and non-cognitive predictors of learning (AP) amongst UAEU students. The objective here is to capitalize on accelerators and resolve obstacles to draw different recommendations to improve learning and AP. In the following the research progresses a literature review and the research model followed by depicting the research methodology, findings, discussion and conclusion respectively.

2 Model development and hypotheses

Figure 1 depicts the research model and its development including hypotheses and item development are explained next.

2.1 The big five personality traits

Extraversion points to the extent to which a person is sociable, talkative, lively, active, adventurous, openness to experience, creative, imaginative and excitable (Peetsma and Van der Veen 2011). However, extraversion may be context-specific and hence, predicting how this factor influence learning styles or GPA is difficult (Komarraju et al. 2011). Also, extraversion person tends to like people, prefer being in large groups, and desire excitement and stimulation (Digman 1990). Accordingly, the following hypothesis is posited:

Hypothesis EXV: Extraversion student is expected to yield higher AP.

Conscientious refers to students who are characterized by their orderly, un-superficial, and precise manner of working which strongly enhances performance during assessment (De Feyter et al. 2012). In addition, it refers to students as being purposeful, organized, reliable, determined, and as ambitious (Digman 1990). Accordingly, the following hypothesis is posited:

Hypothesis CON: Conscientious-student is expected to yield higher AP.

Agreeableness refers to being altruistic, cooperative, and trusting (Digman 1990); and to the extent at which a person is good-natured, helpful, trusting, and cooperative, i.e., empathetic, considerate, friendly, and generous. They also

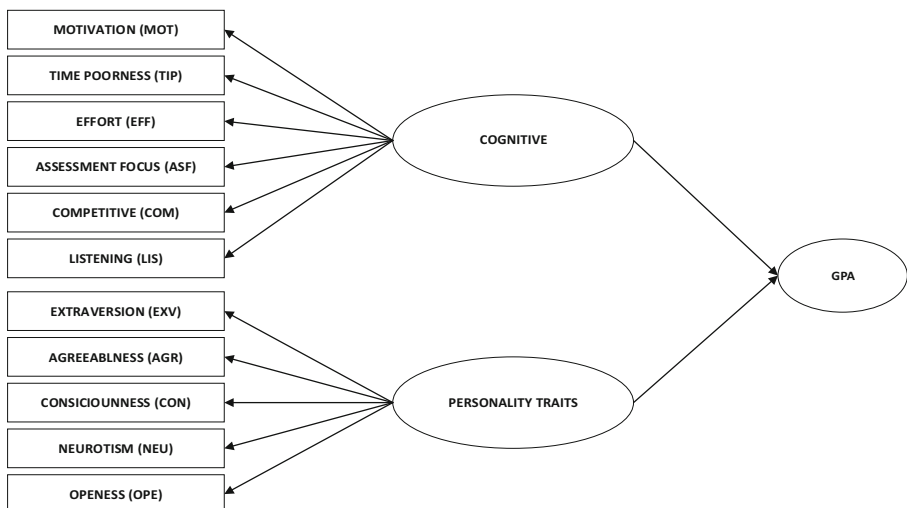


Fig. 1 Determinants of AP

have an optimistic view of human nature. They also tend to believe that most people are honest, decent, and trustworthy (Swinton 2010). Accordingly, agreeableness is expected to impact AP positively (Komarraju et al. 2011) and hence, the following hypothesis is posited:

Hypothesis AGR: Agreeable-student is expected to achieve higher AP.

Students scoring high in openness are expected to be curious about new and challenging materials and to be imaginative (Digman 1990). A student who is open to experience is creative thinker, self-determining and does not like routine work, motivated to engage and understand the world and involve in different activities (Peetsma and Van der Veen 2011). In addition to those features, it also refers to general gratitude for art, emotion, adventure, unusual ideas, curiosity, and variety of experience, and accordingly, its impact on AP is positively strong (Komarraju et al. 2011). Hence, the following hypothesis is posited:

Hypothesis OPE: Openness is expected to enable student to achieve higher AP.

Neuroticism which reflects emotional stability points to the extent to which a person is calm and secure. People scoring high on neuroticism most likely would experience feelings of anxiety, anger, hostile, guilt, and depressed (Digman 1990). They would get frustrated easily (Swinton 2010). Accordingly, researchers believe that neuroticism could have a negative impact on AP (De Feyter et al. 2012; Jensen-Campbell et al. 2007; Komarraju et al. 2011). Therefore, the following hypothesis is posited:

Hypothesis NEU: Neurotic-students are expected to achieve low AP.

In understanding individual student differences and learning, Lynn (2009) found the literature pointing to four main attributes which needs to be addressed: conative (motivation, achievement goals), affective (time-poorness), cognitive and social. He categorized characteristics from the four attributes according to their function in the learning process: learning drivers (motivation, time-poorness) and behaviors (i.e., assessment focus), perception (preferred modality: visual), cognition (sequential or global) and finally, strategies (collaboration). For ease of identification, we call them collectively here as “cognitive factors” (Fig. 1).

2.2 Student motivation and self-regulation

Motivation can be thought of a student’s needs, wants, interests and desires to be engaged in the learning process to achieve high AP (Lynn 2009) unless there is a problem with cognitive skills (Lynn 2009). In a review of the literature, Lynn (2009) reported three main motives for learning: surface (memorizing), deep (understanding) and competitive where each motive entails adopting a different learning strategy. Accordingly, the following hypothesis is posited concerning motivation, and this is followed by self-regulation hypotheses, next:

Hypothesis MOT: Motivated student is expected to achieve higher AP.

2.3 Time-poorness

Aduke (2015) highlighted that time management is a set of practices (i.e., academic, social, meeting deadlines, prioritization, etc.) that work together to help students get more value out of their time. Although it is important to improve the quality of their life but it is usually mismanaged by students. Hence, time as a factor here, has proven its strength in detecting student learning behavior and AP. On the other hand, time-poor student feel more pressurized to complete a learning activity and this exerts high cognitive and metacognitive demands on such student (Lynn 2009). Accordingly, the following hypothesis is posited:

Hypothesis TIP: Time-poor student is expected to have lower AP.

2.4 Mastery effort

Mastery effort can be defined as the amount of time spent by students on studying (Bekleyen 2009) i.e., whether they tried hard, asked for help, and contributed to class activities. Research in this area proposes that as the task appears to be more difficult, students are less likely to undertake it. Other research found that effort is linked to achievement. Hence, students might explore finding out what they need to study, study the topic, and be successful. This is true if such students can do the task, have enough confidence in their abilities, and have no concerns about that task as such (Graham 2006). Accordingly, the following hypothesis is posited:

Hypothesis EFF: Mastery effort student is expected to have higher AP.

2.5 Assessment focus

Goal focus, or assessment focus (Lynn 2009), is defined as “information provided by an agent (e.g., teacher, peer, book, parent, self, and experience) regarding what the agent believed was important and what was required by the assessment procedure” (Wolters 1999). Assessment focus influence students in terms of what and how they learn, their motivation and well-being (Kinga et al. 2012). Accordingly, students focus a lot on grasping the details of the assessment-requirements and hence, the lecturer sets at the heart of their learning and success (Lynn 2009). Accordingly, the following hypothesis is posited:

Hypothesis ASF: Assessment focus student is expected to have higher AP.

2.6 Competitiveness

Koçak and Bayır (2009) found competition (contest between individuals or groups) emerges when two or more parties' race to achieve a goal. This competitiveness creates an atmosphere of creativity and excellence to win. To some extent, competition can

lead to personal improvement and growth (Vedel 2014). Accordingly, the following hypothesis is posited:

Hypothesis COM: Competitive student is expected to have higher AP.

2.7 Listening

Seeing, hearing and touching are considered important complementary learning tools. Listening for example is considered a passive skill and hence, students use it to acquire knowledge almost immediately during a class session (Lynn 2009) where for example, students may prefer listening to the text once or twice in a listening activity to further comprehend the lesson (Bekleyen 2009). In listening, students must use different linguistic and non-linguistic sources to absorb knowledge (Graham 2006). Accordingly, the following hypothesis is posited:

Hypothesis LIS: Listening is expected to increase student's AP.

Finally, as we are interested to know which set of determinants impact AP more than others (Fig. 1), the following hypotheses are introduced:

H1: Cognitive factors have more positive effect on AP.

H2: Personality traits factors have more positive effect on AP.

3 Research methodology

Information about UAE's society and culture could be found in: UAEInteract.com. Also, information about UAEU could be found in www.uaeu.ac.ae.

3.1 Item development and selection

Research survey questionnaire was used to collect data for this study. Standard measures (valid, reliable) were used (where possible) during the development of the questionnaire questions (Premkumar and Roberts 1999; Thong 1999). Some of the previously validated measures had to be adapted to meet the specifications of UAEU's students. Individual characteristics of respondents were based on basic demographic details of students. Student performance (AP) is measured using student General Point Average (GPA) (Vedel 2014).

As for the BigF measures, it is based on the Revised NEO Personality Inventory (NEO-PI) of Costa and McCrae (1992). Caprara et al. (1993) confirmed the same and based their research on the NEO-PI and Hogan Personality Inventory as complements. While the strength of the former was based on its construct validity, well-tested across different kinds of observers, comprehensiveness of the different measures of the BigF, the latter, demonstrate strengths in predictability of AP but its factor structure is not as strong as the NEO-PI (Caprara et al. 1993). Consequently, this research's BigF measures used Caprara

et al. (1993) and Barbaranelli et al. (2003) refined 65 phrase-based items (13 measures for each of the BigF traits).

As for the cognitive factors, Rezaeinejad et al. 2015; Omar et al. (2015) used- and found other researchers using the Index of Learning Styles (ILS) which is made of 44 items to assess preferences on a four-dimensional framework (processing, perception, input, understanding) i.e., active and reflective styles refer to processing, sensing and intuitive styles refer to perception, visual and verbal refer to input and sequential and Global refer to understanding dimension.

This is an initial research in UAE and to have a comprehensive view of the AP spectrum here, the research is challenged with the fact that it could not cover all the above depicted determinants and corresponding items in one survey instrument. Also, we could not eliminate factors and items randomly. To address this, the research introduces the Focus Group (FG) methodology to help us optimize the survey questionnaire by eliminating factors or corresponding measures/items that are perceived to be trivial by the FG sample, made of UAEU students.

3.2 Focus group

Focus Group is defined as the process of obtaining possible ideas or solutions to a problem from a group of participants by discussing it (Blackburn and Stokes 2000). It is a group-participation process that requires no technical skills and usually not costly to implement (Blackburn and Stokes 2000; Bloor et al. 2001). Morgan (1997) indicated that FG research is positioned somewhere between participant observation and in-depth interviews.

In undertaking FG, this research followed certain basic steps. Firstly, there is problem identification and definition (the research questions have been outlined earlier). Secondly, a sampling frame is identified; a group of six to ten or twelve (Blackburn and Stokes 2000) or even up to 14 (Bloor et al. 2001) has been adopted in FG research. Six students have accepted to participate in the FG session. Thirdly, identifying the moderator (facilitator) for the FG session was progressed. This role was undertaken by one of the authors to facilitate discussions between FG participants and did not intervene in the discussions or influencing (biasing) them as such.

The FG session took place at one of the meeting rooms in UAEU and lasted for around 2 h. Notes were taken by the moderator. Students were briefed about the research objectives and then the research factors and corresponding items were posited to the FG participants.

The moderator encouraged a discussion around each cognitive factor and all items on a one-by-one basis. He then facilitated concluding the discussions by reaching to a consensus whether to (1) keep a factor or an item intact or (2) remove it or (3) modify it. Insights from the FG has helped in reducing the number of measures to the ones depicted in the survey questionnaire in Appendix 1. This has resulted in reducing the number of cognitive factors and reducing the items under each factor in terms of their importance to UAEU students. Two items were introduced by students into mastery-effort (3,4) as

they were raised by the FG discussions as important to learning and AP. Some of the measures had to be slightly adapted to fit with the UAE student context.

3.3 Survey research

A research questionnaire using a five-point Likert-scale was used to gather data from respondents. An Arabic translation was provided under each of the English questions in the survey questionnaire. A sample made of 350 students were identified from UAEU students. The printed survey questionnaires were given to students by hand. This actions in addition to the Arabic translation are expected to increase the response rate. After several reminders, we received 193 responses and only 179 were acceptable in terms of completeness. The response rate was around 51% and this was quite effective in accordance with prior research (Premkumar and Roberts 1999; Thong 1999). Responses were coded into an Excel sheet and data was analyzed using SmartPLS software. Most UAE respondents came from the Emirate of Abu Dhabi and Al-Ain city (39.7%) followed by Fujairah (20.1%), Sharjah (17.3%), and Ras Al Khaima (RAK) (15.1%).

4 Goodness of measures

Measures and assessment of goodness of measures can be assessed through convergent and discriminant validity. Firstly, considering loadings and cross loadings from Table 1 to assess if there are problems with any items and using a cut-off value at 0.5 (significance) (Hair et al. 2010) revealed that all items measuring a construct loaded highly on that construct and loaded lower on the other constructs and this has confirmed the validity of our construct.

4.1 Convergent validity

To assess convergent validity, this research used factor loadings, composite reliability and average variance extracted (Hair et al. 2010). It was found that the loadings of all items were exceeding the recommended value of 0.5 (Hair et al. 2010). In composite reliability (Table 2), the construct ranged from 0.588 to 0.948 and this exceeds the recommended value of 0.5 (Hair et al. 2010) or 0.7 in BigF research (Gurven et al. 2013). All alpha values were above 0.6 and this seemed adequate in line with Nunnally and Bernstein (1994) findings. The average variance extracted (AVE) ranged between 0.539 and 0.857 which were greater than 0.50 and hence, further justifying using the research construct (Barclay et al. 1995).

4.2 Discriminant validity

According to Compeau et al. (1999) discriminant validity is examined by testing for correlations between measures of potentially overlapping constructs. In this test, items should load more strongly on their own constructs in the model, and the average variance shared between each construct and its measures should be greater than the variance shared between the construct and other constructs (Table 3).

Table 1 Loadings and cross loadings

	Agreeableness	Competitive	Conscientiousness	Effort	Extraversion	Assessment focus	Listening	Motivation	Neuroticism	openness	Time poorness	GPA
Agree1	0.801	0.177	0.149	0.277	0.479	0.143	0.295	0.391	0.038	0.315	0.248	0.588
Agree2	0.835	0.211	0.131	0.381	0.445	0.189	0.261	0.410	0.008	0.335	0.273	0.586
Agree3	0.758	0.166	0.155	0.238	0.346	0.140	0.167	0.328	0.102	0.307	0.213	0.456
Agree4	0.856	0.200	0.156	0.288	0.468	0.111	0.246	0.432	0.174	0.376	0.306	0.590
Agree5	0.852	0.100	0.044	0.267	0.445	0.027	0.163	0.333	0.115	0.221	0.277	0.589
Agree6	0.635	0.209	0.120	0.257	0.405	-0.017	0.211	0.396	-0.038	0.252	0.157	0.464
Competi1	0.210	0.910	0.253	0.265	0.125	0.373	0.224	0.242	-0.052	0.186	0.245	0.134
Competi2	0.228	0.894	0.290	0.269	0.275	0.373	0.217	0.274	-0.005	0.231	0.166	0.154
Competi3	0.062	0.629	0.057	0.146	0.027	0.172	0.128	0.058	-0.042	0.108	0.110	0.014
Conscient2	0.029	0.228	0.804	0.167	0.060	0.352	0.217	0.142	-0.049	0.253	0.077	0.076
Conscient3	0.179	0.289	0.879	0.263	0.144	0.333	0.262	0.204	0.042	0.292	0.130	0.249
Conscient4	0.146	0.128	0.743	0.226	0.122	0.143	0.298	0.134	0.003	0.167	0.062	0.209
Effort1	0.353	0.211	0.252	0.816	0.307	0.242	0.305	0.420	0.138	0.299	0.194	0.381
Effort2	0.087	0.209	0.164	0.688	0.147	0.088	0.186	0.157	0.086	0.222	0.126	0.159
Effort3	0.316	0.111	0.046	0.588	0.201	0.045	0.119	0.256	0.095	0.245	0.061	0.244
Effort4	0.182	0.110	0.168	0.679	0.196	-0.011	0.117	0.193	0.267	0.189	0.075	0.241
Effort5	0.252	0.287	0.348	0.771	0.347	0.288	0.210	0.246	0.092	0.296	0.209	0.308
Effort6	0.315	0.251	0.181	0.781	0.356	0.195	0.204	0.274	0.129	0.266	0.100	0.328
Effort7	0.297	0.255	0.210	0.804	0.380	0.257	0.183	0.322	0.104	0.313	0.144	0.336
Extra1	0.390	0.157	0.056	0.375	0.739	0.172	0.214	0.356	-0.028	0.344	0.226	0.482
Extra2	0.456	0.136	0.055	0.307	0.869	0.063	0.190	0.415	0.068	0.207	0.181	0.541
Extra3	0.374	0.151	0.159	0.254	0.709	0.042	0.052	0.217	0.028	0.062	0.118	0.420

Table 1 (continued)

	Agreeableness	Competitive	Conscientiousness	Effort	Extraversion	Assessment focus	Listening	Motivation	Neuroticism	openess	Time poomess	GPA
Extra4	0.492	0.168	0.147	0.321	0.824	0.114	0.194	0.322	0.067	0.223	0.260	0.503
Extra5	0.437	0.170	0.152	0.279	0.808	0.037	0.077	0.289	0.090	0.182	0.198	0.427
Focus1	0.147	0.335	0.369	0.244	0.143	0.864	0.188	0.215	0.040	0.244	0.122	0.113
Focus2	0.065	0.319	0.245	0.199	0.052	0.870	0.105	0.100	-0.042	0.187	0.128	-0.021
Focus3	0.094	0.404	0.275	0.151	0.044	0.870	0.169	0.132	0.011	0.194	0.052	0.010
Focus4	0.129	0.312	0.271	0.219	0.122	0.865	0.157	0.180	0.014	0.218	0.128	0.082
Listen1	0.187	0.224	0.274	0.245	0.123	0.183	0.829	0.377	-0.015	0.349	0.065	0.339
Listen2	0.178	0.156	0.288	0.211	0.152	0.143	0.806	0.399	0.015	0.348	0.091	0.331
Listen3	0.274	0.198	0.245	0.223	0.228	0.118	0.861	0.418	-0.021	0.330	0.193	0.376
Listen4	0.285	0.183	0.223	0.233	0.181	0.138	0.797	0.426	-0.007	0.365	0.165	0.330
Listen5	0.249	0.230	0.306	0.203	0.098	0.172	0.859	0.422	-0.037	0.376	0.156	0.355
Motiv1	0.443	0.135	0.130	0.291	0.301	0.092	0.429	0.796	0.110	0.484	0.143	0.497
Motiv2	0.407	0.155	0.187	0.287	0.315	0.106	0.491	0.852	0.130	0.475	0.238	0.540
Motiv3	0.458	0.266	0.195	0.339	0.413	0.202	0.424	0.873	0.113	0.507	0.292	0.567
Motiv4	0.408	0.282	0.179	0.361	0.356	0.142	0.476	0.886	0.142	0.516	0.259	0.541
Motiv5	0.484	0.289	0.222	0.381	0.420	0.197	0.435	0.886	0.121	0.498	0.327	0.568
Motiv6	0.443	0.235	0.210	0.290	0.349	0.124	0.435	0.875	0.048	0.460	0.293	0.549
Motiv7	0.367	0.213	0.141	0.327	0.377	0.167	0.399	0.883	0.051	0.484	0.261	0.500
Motiv8	0.406	0.218	0.114	0.255	0.328	0.229	0.332	0.872	-0.009	0.471	0.294	0.495
Motiv9	0.302	0.190	0.184	0.379	0.286	0.174	0.384	0.807	0.047	0.453	0.196	0.381
Neuro1	0.056	0.003	0.000	0.134	0.039	-0.062	0.003	0.099	0.623	-0.036	-0.126	0.069
Neuro2	-0.014	-0.020	0.019	0.147	0.041	-0.038	-0.016	0.092	0.749	-0.011	-0.075	0.070
Neuro3	0.041	-0.004	0.043	0.105	0.032	0.048	0.051	0.032	0.813	-0.031	-0.101	0.037

Table 1 (continued)

	Agreeableness	Competitive	Conscientiousness	Effort	Extraversion	Assessment focus	Listening	Motivation	Neuroticism	openess	Time poomess	GPA
Neuro4	0.100	-0.019	0.054	0.112	0.006	0.031	0.038	0.058	0.844	0.005	-0.039	0.133
Neuro5	0.100	-0.076	-0.071	0.158	0.097	0.021	-0.112	0.102	0.780	-0.032	-0.010	0.095
Open1	0.127	0.113	0.231	0.238	0.019	0.223	0.373	0.302	-0.015	0.631	0.113	0.251
Open2	0.255	0.165	0.162	0.176	0.143	0.147	0.280	0.369	-0.028	0.780	0.206	0.350
Open3	0.286	0.043	0.269	0.276	0.363	0.118	0.250	0.403	0.036	0.711	0.187	0.369
Open4	0.197	0.205	0.198	0.290	0.158	0.165	0.251	0.344	-0.061	0.704	0.228	0.258
Open5	0.378	0.160	0.227	0.310	0.190	0.205	0.355	0.531	-0.057	0.807	0.236	0.415
Open6	0.362	0.296	0.221	0.290	0.198	0.245	0.388	0.474	0.000	0.761	0.196	0.402
Time1	0.283	0.181	0.146	0.191	0.220	0.109	0.143	0.286	-0.096	0.244	0.908	0.369
Time2	0.289	0.197	0.092	0.176	0.258	0.101	0.169	0.268	-0.108	0.256	0.948	0.359
Time3	0.300	0.233	0.083	0.148	0.221	0.137	0.141	0.279	-0.014	0.246	0.922	0.354
GPA	0.691	0.140	0.234	0.399	0.601	0.060	0.417	0.601	0.113	0.475	0.390	Single item construct

(*) Loadings for items above the recommended 0.5 value are highlighted as Bold text

(*) Conscient2 item was deleted because factor loading was less than 0.5

Table 2 Convergent validity

Model construct	Item	Loading	AVE ^a	CR ^b	Cronbach's α
Agreeableness	Agree1	0.801	0.630	0.910	0.880
	Agree2	0.835			
	Agree3	0.758			
	Agree4	0.856			
	Agree5	0.852			
	Agree6	0.635			
Competitive	Competi1	0.910	0.675	0.859	0.762
	Competi2	0.894			
	Competi3	0.629			
Consciounness	Conscient2	0.804	0.657	0.851	0.741
	Conscient3	0.879			
	Conscient4	0.743			
Effort	Effort1	0.816	0.542	0.891	0.858
	Effort2	0.688			
	Effort3	0.588			
	Effort4	0.679			
	Effort5	0.771			
	Effort6	0.781			
	Effort7	0.804			
Extraversion	Extra1	0.739	0.627	0.893	0.850
	Extra2	0.869			
	Extra3	0.709			
	Extra4	0.824			
	Extra5	0.808			
Assessment focus	Focus1	0.864	0.752	0.924	0.891
	Focus2	0.870			
	Focus3	0.870			
	Focus4	0.865			
Listening	Listen1	0.829	0.690	0.918	0.888
	Listen2	0.806			
	Listen3	0.861			
	Listen4	0.797			
	Listen5	0.859			
Motivation	Motiv1	0.796	0.739	0.962	0.956
	Motiv2	0.852			
	Motiv3	0.873			
	Motiv4	0.886			
	Motiv5	0.886			
	Motiv6	0.875			
	Motiv7	0.883			
	Motiv8	0.872			
	Motiv9	0.807			

Table 2 (continued)

Model construct	Item	Loading	AVE ^a	CR ^b	Cronbach's α
Neuroticism	Neuro1	0.623	0.586	0.875	0.825
	Neuro2	0.749			
	Neuro3	0.813			
	Neuro4	0.844			
	Neuro5	0.780			
Openess	Open1	0.631	0.539	0.875	0.829
	Open2	0.780			
	Open3	0.711			
	Open4	0.704			
	Open5	0.807			
	Open6	0.761			
Time poorness	Time1	0.908	0.857	0.947	0.917
	Time2	0.948			
	Time3	0.922			

5 Hypotheses testing

R² measure the predictive power of the dependent variable in our model (Hair et al., 2006; Vogt 2007). The recommended values for estimating the magnitude of the path coefficients are 0.02, 0.15, and 0.35 representing the relationships of small, medium, and large respectively (Cohen et al. 2004). Together the R² and the path coefficients indicated how well the data supported the adopted model.

Table 3 Discriminant validity of constructs

	AGR	ASF	COM	CON	EFF	EXV	GPA	LIS	MOT	NEU	OPE	TIP
AGR	0.793											
ASF	0.129	0.867										
COM	0.223	0.394	0.822									
CON	0.159	0.339	0.272	0.810								
EFF	0.360	0.238	0.287	0.277	0.736							
EXV	0.545	0.109	0.197	0.141	0.389	0.792						
GPA	0.691	0.060	0.140	0.234	0.399	0.601	1.000					
LIS	0.284	0.182	0.239	0.321	0.268	0.189	0.417	0.831				
MOT	0.481	0.186	0.259	0.203	0.377	0.408	0.601	0.492	0.860			
NEU	0.089	0.010	−0.037	0.006	0.170	0.059	0.113	−0.017	0.098	0.765		
OPE	0.382	0.246	0.223	0.296	0.361	0.262	0.475	0.426	0.562	−0.026	0.734	
TIP	0.314	0.125	0.220	0.116	0.185	0.252	0.390	0.163	0.300	−0.078	0.269	0.926

The diagonal shown in bold text represents the average variance extracted and the other entries represent the squared correlations

5.1 Contextual differences

Cognitive factors and personality traits factors had positive impacts on student's GPA (as shown in Fig. 2). The variance explained by the two independent variables was 0.615 (the power is large as variance is greater than 0.25) with the largest contributor being the BigF context. Both hypotheses were supported at the 0.01 levels (Table 4).

5.2 Determinants of learning

To identify which specific variable in each of the two contexts (Fig. 2) have the most important influence on its corresponding context, Table 5 summarizes the results and is discussed in detail next. Calculating the 2-tailed P Value for all variables revealed that all are significant at the 0.01 level ($P < 0.01$) except for neuroticism which appeared as insignificant (P Value is 0.342).

6 Discussion

6.1 Theoretical discussion and contribution

This research has theoretical contributions and contentions. At the outset, it was shown in this research that both the cognitive factors and the BigF were found significant and hence, the developed research model proved its effectiveness in detecting AP. However, the BigF personality traits were the main predictors of AP amongst UAEU students and

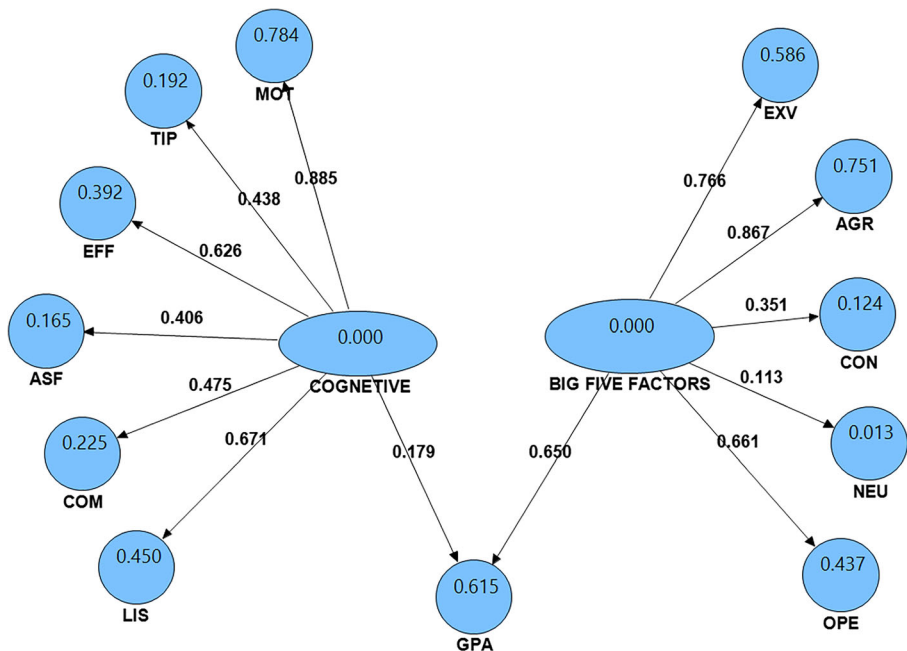


Fig. 2 Resulting path coefficient with loadings, significance and R²

Table 4 Results of hypothesis testing

Variable	Hypothesis	Path coefficient	Path magnitude	t-stats	2-tailed P Value
Cognitive factors	Cognitive factors have a positive effect towards GPA	0.179	Medium (less than 0.35 but greater than 0.02)	2.327	$P < 0.05$
Personality traits factors	Personality traits factors has a positive effect towards GPA	0.650	Large (greater than 0.35)	10.611	$P < 0.01$

this exceeded the role played by cognitive factors. Hence, deeming the role of cognitive factors as marginal here. This seems to go along with most of classical body of research praising the universal significance of the BigF in understanding students' personality traits and in predicting AP. More specifically and in discussing the BigF factors, the research findings indicated that except for Neuroticism (NEU) which was insignificant here the reminder of the other factors were highly significant. Time-poor appeared as significantly impeding UAEU-students' AP. Except for these two contentions in each context, personality traits context had a positive significant impact on GPA where Extraversion (EXV), Agreeableness (AGR), Conscientiousness (CON), Openness (OPE) were all found to be significant. Thus, at the one hand, our findings seemed to go along with most of research that found AP correlating significantly with Agreeableness, Conscientiousness, Openness, and Conscientiousness (Vedel 2014). On the other, our research results did not support another stream of research which found different significant levels across the BigF factors. As discussed earlier in the literature, the myriad perspectives of AP predictors are multifaceted and span different contexts and stakeholders and it would be impossible to capture all their effect on AP in any one study, i.e., what applies to a specific country does not necessarily apply to others. Neuroticism, agreeableness, and conscientiousness more specifically (most significant) were the predictors of GPA with the relationship between openness and GPA was partially mediated by reflective learning styles (Komarraju et al. 2011). Hence, it is suggested here that the research results are more amenable to the UAEU-students' context. This points to other underlying specifics of which culture is one of them.

The implication in this research is that the influence of neuroticism has been found to be insignificant. Trapmann et al. (2007) found only Conscientiousness relating to grades and Neuroticism relating to academic satisfaction and concluded that Extraversion, Openness to Experience, and Agreeableness have no significant impact on academic success. Their moderator analysis suggested effects of culture on the validity of Extraversion. Nye et al. (2013) found that although lower Neuroticism students have lower AP, higher Neuroticism be beneficial for students to excel but under certain conditions such as having formal environments with many rigid rules and regulations, i.e., Neuroticism and not Conscientiousness which makes Russian students follow deadlines and study harder to avoid failure. Thus, it could be argued here that UAEU students did not foresee any effect of Neuroticism on their AP as such. The literature review of De Feyter et al. (2012) highlighted that although conscientiousness and neuroticism were the best predictors of work-related performance (Jensen-Campbell et al. 2007), other research confined the effect of conscientiousness to AP

Table 5 Loadings, and t-values

Variable	Mean	Std. Deviation	Indicator Loadings	t-statistics	Hypothesis (Sig.)	Results (Sig./Coeff)	Results (Sig./Coeff.)	Professional Capitalization
Personality traits context:						+		
EXV: Extraversion	3.87	0.95	0.766	14.799	+	+	UAEU's students like to do a great deal of activities and be with others, friendly, active, happily and lively	Enrich the lives of students in campus within and beyond the classroom through (social activities, sports, behavioral seminars/workshops, personal and teambuilding, hobby clubs, cultural/scientific visits, etc.)
AGR: Agreeableness	3.97	0.94	0.867	35.536	+	+	UAEU's students are honest, trustful, understanding and helpful, passionate and like to give gifts	Endorse such features beyond a student's closed circle of friends through conducting collaborative and cooperative academic and nonacademic tasks and activities with more emphasis put on the latter. This could be the basis for developing leadership aspects.
CON: Conscientiousness	3.45	1.048	0.351	3.733	+	+	UAEU's students are careful, ordered, focused and persistent	Increasing students' learning capabilities on/off campus to take their studies more seriously. This could be the basis for developing professional-attitude and graduates that are ready for the market
NEU: Neuroticism (item worded negatively)	2.73	1.196	0.113	0.950	–	Not	UAEU's students are not: depressed, arguable, tempered, tense or always consumed with guilt	Conducting preventive workshops and seminars to boost-up students' moral and mental wellbeing i.e., encourage a spirit that rewards achievements and remedy in the case of error or mistakes (avoid punishment totally) Adding the enjoyability component into learning in the classroom is important i.e., edutainment.

Table 5 (continued)

Variable	Mean	Std. Deviation	Indicator Loadings	t-statistics	Hypothesis (Sig.)	Results (Sig./Coeff.)	Results (Sig./Coeff.)	Professional Capitalization
OPE: Openness	3.78	0.961	0.661	9.858	+	+	UAEU's students are knowledgeable and open to learn and understand new knowledge, open to new cultures, imaginative, creative, and interested	This could be the basis for higher levels tasks and deeper learning maybe involving mixed teams or overseas internship/exchange program.
Cognitive context:								
MOT: Motivation	4.04	0.97	0.885	41.756	+	+	UAEU's students are joyful learner, practical, achiever, logical and hardworking learner, self-challenge, thinker, and select appropriate times to study without any distractions	This could be the basis for creativity and innovations and hence, tasks and projects should be loosely coupled to leave ample space for students to emancipate. This also could be the basis for creating student's independence.
TIP: Time poorness (item worded negatively in survey)	3.32	1.11	0.438	5.540	-	+	UAEU's students are pressed with time to satisfactorily complete their studies due to work- and family-related commitments	It is worth reviewing students' loads each semester and whether they have sufficient time to cover all courses adequately. Providing workshops on effective time management and utilization Endorsing community networking and engage the families of students by understanding the importance of freeing them to have more time to study
EFF: Mastery Effort	3.37	1.018	0.626	9.979	+	+	UAEU's students are pushing their study habits to excel through considering the prescribed textbook, additional readings, and slides and in understanding difficult tasks and assessment	Capitalize on this item by providing case studies to further supplement student learning habits. Also, by adding the projects component and allow students the access to scientific journals.

Table 5 (continued)

Variable	Mean	Std. Deviation	Indicator Loadings	t-statistics	Hypothesis (Sig.)	Results (Sig./Coeff)	Results (Sig./Coeff.)	Professional Capitalization
ASF: Assessment Focus	4.23	0.942	0.406	3.845	+	+	UAEU's students pay attention to requirements and look for hints about exams and other assessments from lecturer AP.	Adding detailed assessment discussions and criteria by lecturers should further student AP.
COM: Competitiveness	3.82	1.018	0.475	5.469	+	+	UAEU's students are ambitious and career oriented and want top grades to secure a lucrative job after graduation	Providing career advice earlier on through seminars and workshops and visits to employer sites should further motivate student's competitiveness
LIS: Listening	3.78	0.998	0.671	12.494	+	+	UAEU's students are more listeners than readers	Lecturers should focus on this aspect and make sure to explain all concepts to students in class. Improving the English language reading capabilities of students through assigned readings and written assignments. Also, maybe create reading clubs or having competitions for reading/writing i.e., best essay, paper, etc.

only and portrayed mixed views about the effect of the remaining four factors on AP. Maybe neuroticism does not relate directly to AP as such which could be investigated later by any future research.

Nye et al. (2013) found the BigF were the significant predictors of exam results of different subjects but not for the overall GPA in Russian Universities. Also, they noted that although conscientiousness was named as major predictor of AP by most of the literature it was found insignificant in Russian universities and it was attributed to cross-cultural differences in the educational environment. The same researchers found the literature reporting the following different views across different countries: AP among university students is significantly related to conscientiousness (as a major predictor), agreeableness, neuroticism (negative predictor) and openness to experience though some differences exist in those studies, which may have been tied to sample peculiarities; i.e., a study of Iranian university students shows that neuroticism and extraversion were also significant predictors and both of them are negative; a UK study showed conscientiousness was the only significant predictor of AP in university; a US study showed that conscientiousness, agreeableness and extraversion were the only significant determinants of AP. Such contrasts related to cultural and institutional differences across the two contexts. This is evident in students with different educational levels and in different countries as each segment possesses different educational requirements. However, the implication here and indeed, a limitation, is the importance of addressing such idiosyncrasies and control for their effect on AP such as understanding the educational process (i.e., social interaction) used in each country to justify AP results as well. According to McCrae and John (1992), Agreeableness appears in selflessness and support which further highlight the importance of social interactions amongst i.e., UAEU students as an important part of the educational process and AP. It is worth investigating the above implications further from a cultural perspective by any future research.

Cognitive context was found to have a positive impact on GPA. Motivation (MOT), Time Poorness (TIP), Effort (EFF), Assessment Focus (ASF), Competitive (COM), Listening (LIS) were all significant factors in determining AP. This is consistent with results from previous research. As it was worded negatively (in reverse) in the survey questionnaire, time-poorness appeared with positive coefficients and hence, respondents indicated it will impact AP negatively. This is seemed to be in line with previous research but represented a problem here. This indicates that UAEU students are not managing their time appropriately. Future research could expand on this factor and identify areas of weaknesses. For example, Aduke (2015) research showed that there was significant relationship between time management and students' academic performance but stressed on that students need to properly use their time to be more effective in their various assignments. Similarly, Miqdadi et al. (2014) found that time management is highly related to academic performance and indeed students did suffer from procrastination, disorganization, interruptions, work load stress, planning and prioritization.

At the methodological level, the introduction of the FG research represents a contribution in this research as it allowed us to further optimize and validate the original survey questionnaire. The use of plural methods is well justified here. Gallivan (1997) indicated that the use of mixed-methods approach could link both positivist and interpretivist researchers. The importance of the integration between the positivist

(survey) and the interpretivist (FG) view in this research is that the interpretivist understanding is used to confirm the positivist one.

Researchers here and elsewhere interested in understanding the learning abilities and orientations of their students could replicate this study (or add to it) in their universities and compare the results.

6.2 Professional discussion

At the professional level, the research results will benefit professionals and policymakers interested in addressing student's weak and strong learning traits and orientations. Different suggestions were made to enhance student's learning abilities and orientations in UAEU by designing focused programs and initiatives (Table 5). By capitalizing on the four significant parameters of the BigF personality traits of UAEU's students will further students' AP. This may even dampen the effect of other adversary traits like neuroticism and time-poorness. Professionals could provide different consultancy services and devise many training program and workshops aiming at enhancing student AP in the direction of the suggestions made in Table 5. Also, such suggestions could benefit policy makers in drafting their policies and actions. Policy makers of educational institutions and authorities could devise policies and strategies and develop corresponding means and measures to affect such policies aiming at improving student AP in higher education institutions. They could even prioritize their approaches by focusing on the BigF first as it was highly significant here than orientation strategies. However, culture is a very challenging issue to unravel and this needs the cooperation and collaboration of the whole community surround learning in general and the family more specifically.

7 Conclusion

This research was developed with a focus to understand student traits and learning orientations in UAEU. Using a survey questionnaire, the research reviewed relevant literature in pedagogy and developed a framework that highlighted important learning determinants and hypothesized their effect on AP (GPA). This research introduced the BigF in conjunction with other student's learning orientations which provided insight into the nature of the diverse preferences, styles and strategies of UAEU students. This is an initial research in this area in UAE and indeed, the researchers maximized the opportunity and attempted to examine different variables to generate initial insights first before delving in pursuing more relevant and focused factors to UAEU. Thus, learning drivers were introduced here in a pragmatic manner (Lynn 2009) but of course, strictly guided by theory and the focus group research played an important role here.

The BigF personality traits and the remaining factors shed interesting insights and contrasts at the same time on students learning abilities and orientations. What could be suggested from such emerging issues here vis-à-vis the literature, is that each region, country or even university has its own set of effects that impacts student learning. This reflects in addition to other issues in this research to the cultural perspective.

In discussing the research limitations, due to the cross nature of this study, direction of causality could only be inferred and hence further research (i.e., qualitative) is needed. Using the FG discussions, this research provided plausible interpretations as to what to include or exclude from the research model and assisted in justifying some of the survey's findings, but this is not enough, and any future research could complement the survey research with full qualitative one to provide more explanations and "thick" descriptions.

Although this study considered students' views only, this does not eliminate the important role of investigating direct (instructor, courses, colleges, family) and indirect (administration, Ministry, etc.) stakeholders and their role in enhancing the learning content/process. Indeed, this study have provided many suggestions to improve this perspective. It is also as important as to highlight it is only with the integration of the different roles and views in the learning process that effective lifelong learning could happen. However, affecting such changes are not automatic rather, it should be taken in a piece-meal fashion. Indeed, it should be executed as part of a long-term strategy. That the stakeholders involved in education are vast and dispersed which further emphasize the importance of the integrative effort and process.

Finally, the research suggested different futuristic research areas, but it should be highlighted here that this research was limited to certain factors and items. It is left to other researchers to adopt more factors and measures and generate more insights about what make students learn and excel.

Appendix 1. The survey questions

A. Extraversion

1. like to do a great deal of activities
2. like to be with others
3. can easily say to others what I think
4. do something not to get bored
5. happy and lively

B. Agreeableness

6. behave correctly and honestly with others
7. understand when others need my help
8. like to give gifts
9. treat my peers with affection
10. If a classmate has some difficulty, I help her/him
11. trust in others

C. Conscientiousness

12. do my job without carelessness and inattention
13. When I start to do something, I have to finish it at all costs
14. like to keep all my university things in a great order
15. It is unlikely that I divert my attention

D. Neuroticism

16. usually in a depressed mood
17. argue with others with excitement

18. easily get angry
19. easily lose my calm
20. usually feel guilty even about silly things

E. Openness

21. know many things
22. have a great deal of imagination
23. easily learn what I study at class
24. able to create new games and entertainments
25. like to know and to learn new things
26. would like very much to travel and to know the habits of other countries

F. Motivation

1. make university work enjoyable by focusing on something about it that is fun
2. try to find ways that the material relates to my life
3. remind myself about how important it is to get good grades
4. push myself to see if I can do better than I have done before
5. persuade myself to work hard just for the sake of learning
6. challenge myself to complete the work and learn as much as possible
7. think about trying to become good at what we are learning or doing
8. try to study at a time when I can be more focused
9. try to get rid of any distractions that are around me

G. Mastery effort

1. try to be strict with myself in my study habits, so that I can do the very best I can
2. look at most of the additional readings suggested by the lecturer
3. limit my studying to the slides only
4. use the prescribed textbook in my study
5. make sure I clearly understand the assessment requirements early in the course
6. usually set out to understand thoroughly the meaning of what I am asked to read
7. usually put a lot of effort into trying to understand things that at first seem difficult

H. Time-poorness

1. don't have enough time to do as much study as I need to for my course
2. Other things such as work, and family do not leave me enough time to think about the ideas from my studies
3. Often, I don't have enough time to really understand the ideas I read about

I. Assessment focus

1. pay close attention to information the lecturer gives about exams
2. Lecturers sometimes indicate what is likely to be in the exams, so I look out for hints
3. take care to find as much information as possible on what will be in an exam
4. When working on an assignment, I try to keep in mind exactly what the lecturer seems to want

J. Competitiveness

1. want top grades in my studies so that I will be able to select from among the best jobs available
2. see myself as an ambitious person
3. The main benefit of a university education is that it will enable me to earn more money

K. Listening

1. remember best things that are spoken
2. remember best what I hear
3. prefer listening to the lecturer than reading textbooks
4. prefer listening to reading
5. understand better if the lecturer explains things rather than reading about them

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