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# Admissions Counselors' Perceptions of Cognitive, Affective, and Behavioral Correlates of Student Success at an Independent High School: A Mixed Methods Study

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# Admissions Counselors' Perceptions of Cognitive, Affective, and Behavioral Correlates of Student Success at an Independent High School: A Mixed Methods Study[1]

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# Introduction

"Through the recruitment, selection, and enrollment of students, admission and enrollment management professionals play a critical role in their schools' vitality and educational culture" (NAIS, 2012, para. 2). According to the Principles of Good Practice, stated by NAIS (2012), through the admission process schools seek to ensure an appropriate match between prospective students/families and the school. For admission professionals to make the most effective decisions for both the school and applicant, they gather materials to get to know the student on a deeper level. These materials include, but are not limited to, a formal application, transcripts (often from the past 2 ½ years), two or more teacher recommendations from current teachers, a school visit, on-campus interview, and admission test scores.

There is limited evidence to demonstrate the attributes that admission counselors find important to academic success beyond test scores and quantitative evidence gathered during the admission process. There is an abundance of evidence supporting cognitive, affective and behavioral attributes, which lend themselves to success in 21st century learners (Bandura, 1977, 1986, 1997; Costa & Kallick, 2000; Gardner, 1999; Hayes-Jacobs, 2010; Sternberg, 1999, 2010), but limited evidence of how admission counselors are measuring these attributes.

The purpose of this research was to identify attributes within the cognitive, affective, and behavioral domains that Admission Counselors feel are essential to student success in school and life.

# Literature Review

While there is limited research to support the relationship between student academic success and standardized test scores in the high school admission process, there is a great deal of literature that supports the importance of data-driven decision making in education. The importance of strong attributes within the cognitive, behavioral, and affective domains for student academic success in school and life is also prevalent in the literature. Examples of these attributes range from critical thinking and problem solving skills, to self-efficacy, collaborative skills, and even humor. The following is a brief summary of the literature supporting the research for validation of the importance of cognitive, behavioral, and affective student attributes for success in high school.

Concrete evidence was available to support the importance of attributes to student success within the cognitive, affective, and behavioral domains. One of the primary sources used to support the research across all three domains was Sternberg's work in areas such as *successful intelligence;* broadening college admission testing to include analytical, practical, and creative skills; and the Wisdom, Intelligence, and Creativity Synthesized (WICS) model of leadership and assessment (Sternberg, 2006, 2008, 2010).

Within the cognitive domain the importance of 21$^{st}$ century skills for our current students, including, but not limited to, critical thinking skills, creativity, leadership, innovation, and adaptability are evident. These skills are supported through evidence in a study conducted by Sternberg and Grigorenko (2000) in which they identified ways to assess students beyond testing their analytical skills by supplementing the SAT with creative and practical measures. "In all creative processes we are pushing the

boundaries of what we know now, to explore new possibilities; we are drawing on the skills we have now, often stretching and evolving them as the work demands" (Robinson, 2011, p. 152). Abstract thinking and finding new solutions to problems are two additional cognitive attributes that demonstrate a student will find success in their academic setting (Tough, 2012; Houle & Cobb, 2011).

In addition, emotional Intelligence was found to be a significant predictor of academic success as well as conscientiousness (Heaven & Ciarrochi, 2012; Parker, & Creque et al., 20014;). An inquisitive nature, self-efficacy, and humor are all important affective attributes to student success in school and beyond. Educators should identify a profile of student attributes, which they will strive to cultivate within their student body, with the most important being self-directed learner and inquisitive learner (Spady & Schwann, 2010). It is believed that self-efficacy can have a positive impact on academic outcomes as well (Bandura, 1977, 1986, 1993, 1994, 1997; Pajares, 1996; Schunk, 1982). Humor is not only linked with high emotional intelligence and positive psychological functioning (Costa & Kallick, 2000; Pink, 2006), it is also found to have link to effective leadership ability (Pink, 2006).

Within the behavioral domain, responsible risk-taking, motivation, and negative behaviors all have an impact on academic success. A students' ability to think critically about their work, edit, be flexible to constructive feedback, as well as demonstrate resiliency and grit, are life skills that are important to student success (Costa & Kallick, 2000; Adams, 2012).

Sternberg (2006, 2007, 2011) suggests that the assessments used in the admission process (for both secondary and postgraduate schooling) should better reflect the

qualities that matter most throughout life and not just during a student's education. Admission Counselors should identify the competencies that are essential to student success and assess applicants in a way that will portray those competencies.

Tony Wagner's (2008) seven survival skills, which he feels are essential to life-long learning, active citizenship, and today's workplace, provide a nice balance of the cognitive, affective, and behavioral attributes supported in the literature. The survival skills include critical thinking and problem solving, collaboration and leadership, agility and adaptability, initiative and entrepreneurialism, communication, accessing and analyzing information, and finally curiosity and imagination.

Ultimately, data-driven decision making is an important tool to help improve the success of students and schools (Marsh, Pane, Hamilton et al., 2006). It is the school's responsibility to establish a procedure for quantifying even the most qualitative attributes, allowing for the most accurate and effective admission decisions. "We all know that there are some things that cannot ever be measured when evaluating students and their potential to succeed in school. What we do is part art and part science" (Chaffer Schroeder, 2011).

## Research Question

1. What are the perceptions of Admission Counselors with respect to the following:
    a. cognitive, affective, behavioral attributes of student success, and
    b. how admission counselors are measuring these attributes within their applicant pool.

# Methodology

While the literature regarding important attributes for success in school and life is vast and growing, including the support of cognitive, affective and behavioral characteristics (Bandura, 1977, 1986, 1997; Costa & Kallick, 2000; Gardner, 1999; Hayes-Jacobs, 2010; Sternberg, 1999, 2010), there is little research literature that examines the perceptions of the Admission Counselors responsible for determining the acceptance of students into independent schools.

This research was conducted in two phases. Phase 1 was carried out to examine the student attributes which admission counselors find important to high school academic success within the cognitive, affective, and behavioral domains. Phase 2 was carried out to learn what Admission Counselors are doing to measure the important attributes that were identified through the Student Attribute Survey.

## Research Design

A mixed methods quantitative/qualitative research design was used to conduct the research. The data were collected in separate phases and an in-depth qualitative study followed to further explain the results of the quantitative study. The results from both studies were brought together in the interpretation of the data. Survey data were collected from Admission Counselors through a national online survey followed by individual interviews of Admission Directors.

## Sample

A total of *N*=533 Admission Counselors were asked to complete an online questionnaire to learn about their perceptions of the importance of students' attributes within the cognitive, behavioral and affective domains during the admission process that are related to success in high school. A total of 230 (43%) Admission Counselors completed the survey. At the end of the survey, individuals were invited to respond through email if they were interested in learning about the results of the study. For the qualitative component, individual interviews were conducted with *N*=8 Admission Directors. The individuals, who expressed an interest in the research by responding through email, were invited to take part in the individual interview portion of the research. An email invitation was sent detailing the purpose of the research and an explanation that interviews would be conducted in person or through Skype at the individual's convenience.

## Instrumentation

### Admission Counselor Survey

The survey questionnaire developed by the researchers consisted of three domains: cognitive (8 items), affective (10 items), and behavioral (12 items). See Appendix B for a sample survey. Respondents were asked to rate the attributes on a 5-point Likert-type response scale ranging from *not important* to *very important*. The items consisted of attributes that Admission Counselors may or may not deem as important for students to possess to be considered for admission success in high school.

**Validity.** Three types of validity evidence are presented in this research: *evidence based on survey content*, *evidence based on internal structure of the survey,* and

*relations to other variables*. Survey content (i.e., content validity) was supported through the literature and the judgments of four Admission Directors (American Educational Research Association, 1999, p. 11).

Validity evidence regarding internal structure (i.e., construct validity) was examined using a confirmatory factor analysis (American Educational Research Association, 1999, p. 14). Using IBM SPSS AMOS 20.0, correlations among the 30 items were calculated. Listwise deletion of cases with missing data was used. There were 223 cases out of the possible 230 with no missing data. The researcher, through the literature and discussions with Admission Counselors and Admission Directors, identified the three latent variables. The 30 observed items were actual items from the Cognitive, Affective, and Behavioral sections of the Student Attribute Survey. In the CFA, 27 of the 30 items were freely estimated as one item per factor served as a marker variable. In addition, the covariances among the three latent constructs were estimated.

Table 1 contains the fit indices for the CFA models tested. The first column provides a summary of the resulting goodness-of-fit indices for the original three-factor model involving the entire 30 items from the survey. Chi-square was statistically significant; chi-square degrees of freedom ratio was greater than 2.0; Tucker-Lewis index (TLI) and comparative fit index (CFI) were < 0.90; and root mean square error of approximation (RMSEA) was > 0.08; all suggesting that that the specified model did not fit the data well (Hu & Bentler, 1999; Mccoach, Gable, & Maduras, 2013).

Table 1

*Fit Indices for Confirmatory Factor Analysis Models Tested*

| Index | Original 3-Factor Model with 30 Items | Final 3-Factor Model with 14 Items Retained |
|---|---|---|
| Chi-square | 1263.98 | 161.86 |
| df | 402 | 74 |
| Probability | < 0.001 | < 0.001 |
| Chi-sq/df ratio | 3.14 | 2.19 |
| TLI | 0.686 | 0.897 |
| CFI | 0.709 | 0.916 |
| RMSEA | 0.098 | 0.073 |

In an attempt to improve the model fit, standardized residuals and modification indices (MI's) were examined. Standardized residuals represent differences between the implied covariance matrix and the observed covariance matrix and reflect possible sources of model misfit (Netemeyer et al., 2003). Standardized residuals with absolute values > 2.57 are considered statistically significant (Netemeyer et al., 2003); a number of items had standardized residuals greater than + 2.57. Inspection of the MI's also revealed that these items would greatly benefit from the addition of correlated errors (MI's > 20.0). However, because the objective of the present study was to develop a valid instrument with reliable data for measuring cognitive, affective, and behavioral factors, and not simply to produce the best fitting model, items were deleted from the survey and the CFA was run again.

The second column of Table 1 provides a summary of the resulting goodness-of-fit indices for this revised model. All fit indices improved as a result of this revised model.

Using the recommended standards of Hu and Bentler (1999), overall model fit was deemed adequate. The Chi-square/df ratio (2.19) approached the recommended level of 2.0, TLI (0.897) and CFI (0.916) were near or > 0.90, and RMSEA (0.073) was < 0.08.

**Reliability of the Data.** Considering the results of the CFA, reliability analyses were run on the four items retained in the Cognitive factor, the six items retained in the Affective factor, and the four items retained in the Behavioral factor. The Cronbach's alphas for the data from the three subscales were quite adequate, as they were .81, .80, and .81, respectively (see Table 2).

Table 2

*Reliability Statistics for Each Factor in the Final CFA Solution*

| Factor | No. Items | Cronbach's Alpha | Mean Inter-Item Correlations | SD of Inter-Item Correlations |
|---|---|---|---|---|
| Cognitive | 4 | .81 | .52 | .12 |
| Affective | 6 | .80 | .39 | .05 |
| Behavioral | 4 | .81 | .51 | .07 |

**Final Version of the Student Attribute Survey.** Results from the CFA suggested several modifications that resulted in a refined and more parsimonious version of the Student Attribute Survey. Figure 1 illustrates the three-factor model. The three circles represent the Cognitive, Affective, and Behavioral domains addressed. The boxes contain the item numbers associated with each domain. Figure 2 contains the same

model with additional data. The numbers near the three curved arrows represent correlations among the Cognitive, Affective, and Behavioral factors ($r$ = .58 to $r$ = .76). The numbers next to the straight-line arrows projected from each factor to the items defining the factor are the standardized regression weights from the factor pattern matrix presented later in Table 3. The numbers next to each item box are the $r$-squared values or the amount of variance in each item explained by the three-factor solution.

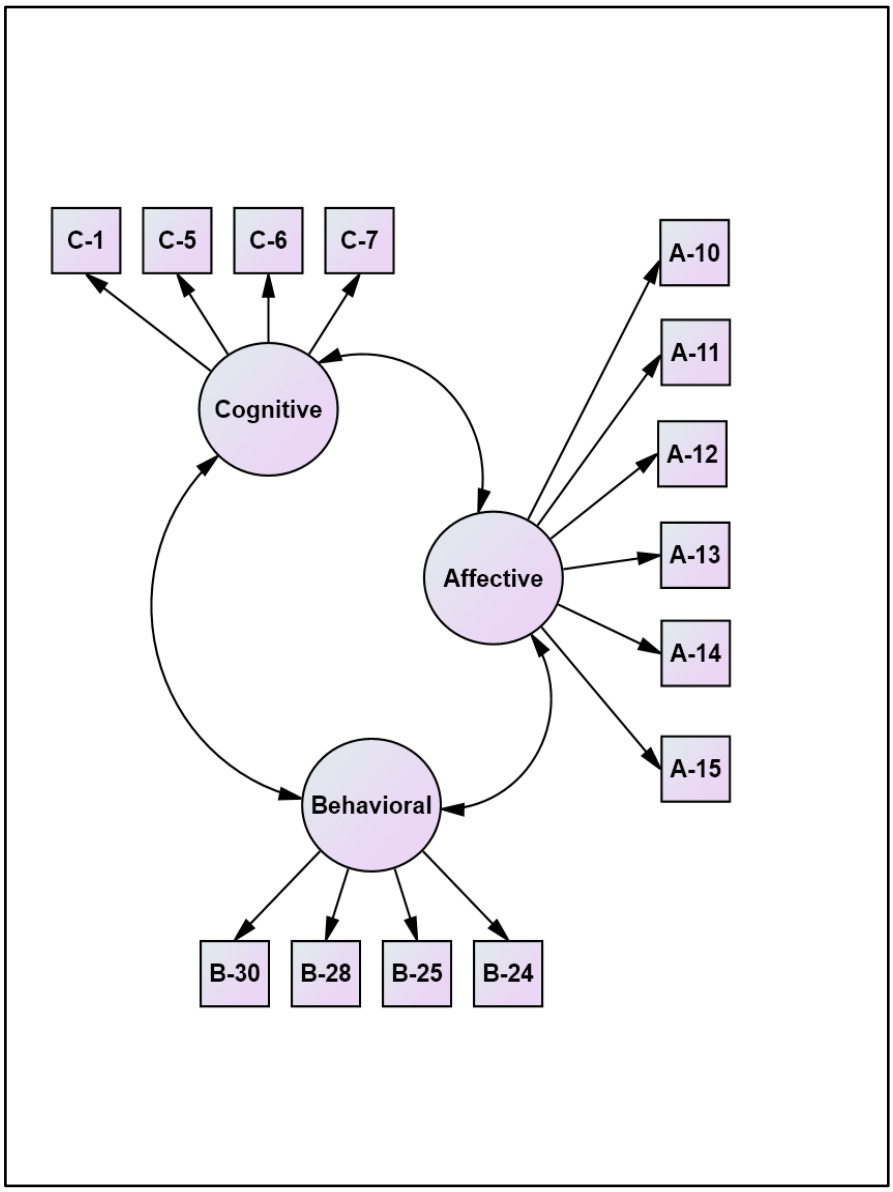


*Figure 1. Three-Factor Model of the Student Attribute Survey*

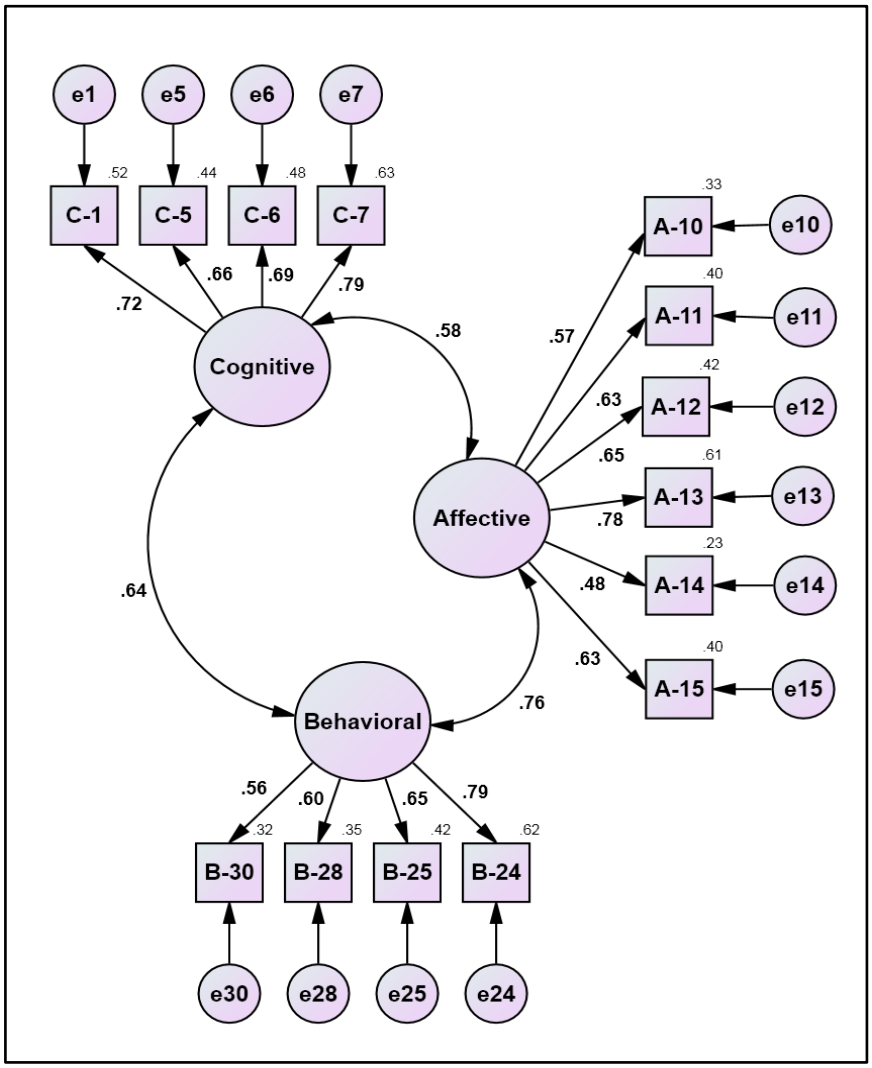


*Figure 2. Standardized Model*

The resulting 14-item, three-factor scale is psychometrically sound, with reasonable factor structure and good internal consistency reliability.

Table 3

*Standardized Factor Pattern Coefficients for the Final 14-Item, 3-Factor Model*

| | | Factor | | |
|---|---|---|---|---|
| Items | | Cognitive | Affective | Behavioral |
| C-1 | Critical Thinking | .72 | | |
| C-5 | Creativity | .66 | | |
| C-6 | Curiosity | .69 | | |
| C-7 | Problem Solving | .79 | | |
| A-10 | Interest in School | | .57 | |
| A-11 | Internal Motivation | | .63 | |
| A-12 | Self-Control | | .65 | |
| A-13 | Passion for School | | .78 | |
| A-14 | Emotional Stability | | .48 | |
| A-15 | Personal Importance of Education | | .63 | |
| B-24 | Ability to Listen | | | .79 |
| B-25 | Task Completion | | | .65 |
| B-28 | Adaptation | | | .60 |
| B-30 | Resilience | | | .57 |

Table 3 contains the standardized factor pattern coefficients for the final 14 item, three factor model. These parameter estimates for the final model are sufficiently high to indicate the meaningful contribution of each item to defining the factor.

**Admission Counselor Interviews**

The research also included an interview of *N*=8 Admission Directors from independent school settings regarding their perceptions of student attributes for success in school. Rubin and Rubin (2005) support qualitative interviewing as a way to gather information that is unique to an individual. This is a different approach than survey research, which asks the same questions to everyone being surveyed. The strategy

employed for the interviews was semi-structured, with partial guidance from the researcher. Sequenced questions were asked to gather more specific information, which led the interviews in a general direction. Probing was used during the interview process to maintain that direction.

## Data Collection

As noted earlier, *N*=533 Admission Counselors were invited by email to participate in the online questionnaire. A total of 230 (43%) individuals completed the survey. A group of *N*=40 Admission Directors were invited to take part in an individual interview, following the completion and review of the surveys. Interviews were conducted with *N*=8 Admission Directors. An incentive of 10 - $50 Visa Gift Cards were offered, in a drawing, to those that participated in the online survey.

## Data Analysis

**Quantitative Approach.** Descriptive statistics were used to analyze the data from the Student Attribute Survey.

**Qualitative Approach.** Krippendorff's (2004) content analysis method was used to analyze the verbal content gathered in the individual interviews. Emerging themes were then grouped together, by what Krippendorff (2004) has termed clustering. These "clusters" shared a particular quality. Interviewing is a way to get to know a person's beliefs, attitudes, and expectations, while the content analysis of the interview transcripts allowed the researcher to identify qualitative inferences from the material being analyzed during the coding process (Krippendorff, 2004).

Within the independent school community, a purposeful sample of admission professionals who participated in the survey was drawn (Patton, 2002). Follow-up

interviews were conducted with *N*=8 survey participants. Depth interviews, with a semi-structured format, were conducted within four weeks of the participants completing the Student Attribute Survey. One interview was conducted face-to-face with the participant, four interviews took place through Skype, and the remaining three were conducted via telephone. The average interview was 25 minutes with a range from 18 to 45 minutes. Interviews were tape recorded and transcribed for analysis.

## Findings

The primary purpose of this study was identify attributes within the cognitive, affective, and behavioral domains that admission counselors feel are essential to student academic success and determine what admission counselors are doing to measure those attributes during the admission process.

What are the perceptions of admission counselors with respect to the following:

a. cognitive, affective, behavioral attributes of student success, and
b. the importance of grade 8 SSAT verbal, quantitative, and reading scores for student academic success in high school?

The Student Attribute Survey asked admission counselors to rate the importance of 30 attributes within the cognitive, affective, and behavioral domains. The descriptive data for the entire set of 30 items is presented in Appendix B. A confirmatory factor analysis (CFA) determined that data for the 14 of the 30 attributes best fit the hypothesized thee domain model: cognitive, affective, behavioral. The remaining 16 attributes were removed from the analysis due to poor fit with the hypothesized model. The attributes which best defined the **cognitive domain** included critical thinking, creativity, curiosity, and problem solving. The attributes which fit within the **behavioral domain** were resilience, adaptation, task commitment, and ability to listen. Within the

**affective domain**, the optimal attributes were intrinsic motivation, self-confidence in academic skills, emotional stability, perceived importance of education, passion for school, and interest in school. Table 4 presents descriptive data for the items identified by the confirmatory factor analysis within each of the three domains.

The domain with the greatest importance was **cognitive** (*M*=4.30, *SD*=*.54),* followed closely behind by the **behavioral** domain (*M*=4.17, *SD*=.50), with **affective** being rated as the least important (*M*=4.09, *SD*=.50). Within each of the three domains, items were also ranked by importance. Critical thinking (*M*=4.58, *SD*=.57) was the most important and creativity (*M*=3.97, *SD*=.75) was least important within the cognitive domain. Within the behavioral domain, ability to listen (*M*=4.30, *SD*=.63) was identified as most important while adaptation (*M*=4.07, *SD*=*.67)* was the least important. The affective domain, which was the least important of the three domains, ranked interest in school (*M*=4.42, *SD*=.65) as most important and self-confidence in academic skills (*M*=3.80, *SD*=.70) least important. When provided the opportunity to provide *other* responses, grit, parental support and involvement, and determination were most frequently listed as important predictors of success in an independent school setting.

Table 4

*Importance Rating, Mean and Standard Deviation for Attributes within the Student Attribute Survey, Ranked by Mean*

| | Attributes | | Importance Rating | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| | | | 1 | 2 | 3 | 4 | 5[a] | *M* | *SD* |
| **Cognitive** | | | | | | | | **4.30** | .54 |
| C-1 | Critical Thinking | *f* | | 1 | 6 | 81 | 142 | 4.58 | .57 |
| | | % | | **>1** | **3** | **35** | **62** | | |
| C-7 | Problem Solving | *f* | | 2 | 15 | 115 | 98 | 4.34 | .640 |
| | | % | | **1** | **7** | **50** | **42** | | |
| C-6 | Curiosity | *f* | 1 | 2 | 29 | 95 | 103 | 4.29 | .75 |
| | | % | **>1** | **1** | **13** | **41** | **45** | | |
| C-5 | Creativity | *f* | | 2 | 53 | 116 | 56 | 3.97 | .75 |
| | | % | | **1** | **23** | **51** | **25** | | |
| **Behavioral** | | | | | | | | **4.17** | .50 |
| B-24 | Ability to Listen | *f* | | | 21 | 115 | 87 | 4.30 | .63 |
| | | % | | | **10** | **51** | **39** | | |
| B-30 | Resilience | *f* | | 2 | 36 | 107 | 78 | 4.17 | .72 |
| | | % | | **1** | **16** | **49** | **34** | | |
| B-25 | Task Commitment | *f* | | | 32 | 129 | 62 | 4.13 | .64 |
| | | % | | | **15** | **57** | **28** | | |
| B-28 | Adaptation | *f* | | 2 | 37 | 127 | 57 | 4.07 | .67 |
| | | % | | **1** | **17** | **56** | **26** | | |

(continued)

Table 4

*Importance Rating, Mean and Standard Deviation for Attributes within the Student Attribute Survey, Ranked by Mean* (continued)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| **Affective** | | | | | | | | **4.09** | .50 |
| A-10 | Interest in School | *f* | | 1 | 17 | 94 | 115 | 4.42 | .650 |
| | | % | | **>1** | **7** | **41** | **51** | | |
| A-11 | Internal Motivation | *f* | | 1 | 31 | 100 | 95 | 4.27 | .70 |
| | | % | | **>1** | **15** | **44** | **41** | | |
| A-14 | Emotional Stability | *f* | | 2 | 30 | 123 | 72 | 4.17 | .68 |
| | | % | | **1** | **13** | **54** | **32** | | |
| A-15 | Perceived Importance of Education | *f* | 1 | 4 | 44 | 125 | 53 | 3.99 | .74 |
| | | % | **>1** | **2** | **19** | **55** | **23** | | |
| A-13 | Passion for School | *f* | | 6 | 58 | 114 | 49 | 3.91 | .76 |
| | | % | | **3** | **25** | **50** | **22** | | |
| A-12 | Self-confidence in Academic Skills | *f* | | 9 | 56 | 133 | 29 | 3.80 | .70 |
| | | % | | **4** | **25** | **58** | **13** | | |

[a] *Importance Rating: 1 = Not Importance, 2 = Of Little Importance, 3 = Moderately Important, 4 = Important, 5 = Very Important*

## Interview Data

Individual semi-structured interviews were conducted following the survey. The interviews, conducted with *N*=8 Admission Directors from independent high schools, focused on three central issues: (1) How much weight do admission counselors feel is being placed on test scores during the admission process? (2) What attributes do

admission counselors consider very important for student academic success? (3) How do admission teams assess these important attributes during the admission process? Krippendorff's (2004) content analysis method was used to analyze the verbal content gathered in the individual interviews. Emerging themes were then grouped together, by what Krippendorff (2004) has termed clustering. These "clusters" were grouped together based on the attribute which it was associated with: cognitive, affective, or behavioral.

In the pages that follow, Admission Directors responses to the above questions are presented and analyzed. Although standardized tests play a significant role in the admission process for independent secondary schools, and the quantitative research presented earlier supported the relationship between various components of SSAT admission testing and student success in high school, test scores are not the only deciding factor for admission. The interviews addressed the perceptions of admission counselors with respect to the relationship of the following variables to end of grade 9 GPA scores: grade 8 Secondary School Admission Test scores for verbal, quantitative, and reading.

The content analysis revealed a pattern of participants reporting that standardized admission test scores are just one component to the admission process. All of the Admission Directors agreed that standardized test scores were simply **"one piece of the puzzle"** when it came to determining how well a student would perform at the end of the Grade 9.

There was a mixed response to how much weight each school places on the individual portions of the SSAT (verbal, quantitative, and reading). One Admission Director said:

> So much of the quantitative piece in school work is based on a foundation and it's tough to make up over time, that's why we put a lot of stock in that quantitative score.

Another felt as if their school places more weight on the reading score, stating:

> I think the reading is pretty important in terms of how hard the work will be for kids here; it will take a lot longer if they are slow readers or not particularly efficient readers.

He went on to say:

> If reading scores are low, this tells us that those are the kids that are going to be spending more time than necessary on homework.

When asked if they place more weight on one section of the SSAT over another, one Admission Director stated:

> No, we kind of just look at the whole thing. The only thing we might look at is how many questions they left blank. If they answered every question and struggled, then we think that maybe they didn't realize that they could have left some blank and saved themselves some negative points, but we don't really break it down by section.

One response indicated that the amount of weight placed on specific portions of the SSAT depended on the grade level that the student was applying for.

> We worry less about the math because most of our applicants are applying to 7$^{th}$ grade and because they are coming from so many different districts, it's kind of a diagnostic year anyway. If they are applying for 9$^{th}$ grade it takes on a little more importance. In 9$^{th}$ grade there are three levels of math as opposed to one math class in 7$^{th}$ grade.

Themes that emerged during the interviews to describe the attributes considered *very important* for student academic success included many of the attributes described

in the Student Attribute Survey, but also included others that were not in the survey. The **cognitive** components that Admission Directors felt strongly about finding in their applicants included, but were not limited to, **creativity**, **curiosity**, **critical thinking skills** and **problem solving ability**. These attributes are consistent with the findings from the confirmatory factor analysis (CFA) within the cognitive domain. The above mentioned attributes were determined to have the best CFA model fit and were also affirmed by the Admission Directors as being very important in the admission process.

Within the **affective** domain, Admission Directors discussed **conscientiousness**, **self-awareness**, **awareness and concern for others**, and **humor** as important attributes that they look for during the admission process, but interestingly, these attributes did not demonstrate model fit during the confirmatory factor analysis. This limitation may be due to the small sample size of the *N=8* Admission Directors interviewed, compared to the overall sample size of *N*=230 admission counselors who completed the Student Attribute Survey. One Admission Director said that they are looking for **conscientiousness** in their students and **self-awareness**, as well as students who have **great concern for others**.

> Being a small school, with small classes, having one kid who is not concerned about one of his classmates; that can have an impact on a whole learning environment.

Attributes within the **behavioral** domain, which surfaced during the interview process, contained a combination of attributes included in the Student Attribute Survey and others that were not included in the survey. The attributes that were deemed very important by Admission Directors during the interview process and where included in the survey were a **student's ability to listen and communicate effectively, resilience,** and **collaborative skills**. **Ethical behavior** and **integrity** were also

important qualities. There were several attributes that were discussed during the interview process as being very important, but were not included in the survey. These included **poise and maturity, self-advocacy,** and **perseverance**.

> There is a commitment that we are looking for; a willingness to stay the course, even when it gets tough.

Another Admission Director said:

> It's that willingness to be involved and invested in our school community, the immeasurable little spark that is evident in an applicant, that's what I look for.

**Communication skills** were an important attribute collectively among the Admission Directors interviewed. This attribute was included in the Student Attribute Survey, but it was not selected from the confirmatory factor analysis as one of the attributes demonstrating model fit.

> It's definitely important for us that a kid can have a conversation.

> I'm not expecting the 20 minute answers, but we need to have a conversation, not one word answers. I'm looking for a student who has the ability to be a conversationalist.

Overall, the content analysis of the Admission Directors interview data suggested that the cognitive, affective and behavioral domain attributes identified in the Student Attribute Survey reflected the profile of the optimal students in their applicant pool.

> When we talk about what we do as a school community we talk about the end product, more than just getting into the right colleges, it's about developing the 21st century skill set necessary for being successful in life.

The last topic that was addressed during the interview process was what admission teams are doing to measure the attributes which they identify as being *very important* for student academic success. Within the **cognitive domain** they stated the following:

> I think it's tough to really look at **critical thinking skills**, I don't pose questions to them that are really going to demand that. A good teacher recommendation would address/respond to that. Unfortunately there are lots of times that the teachers

check the list and that's it. This leaves me uncertain as to how strong the students critical thinking skills really are, but sometimes it's what the recs don't say!

I think in terms of **critical thinking**, you can pick that up from the application and how they write. Which items they chose to answer and how they answer.

**Critical thinking skills** may be the hardest to measure at a young age. So that is when we fall back to the SSAT, we have to fall back to something that is across the board, every child will be taking. If I don't know the feeder school, then sometimes this is the best indicator for me as too how well a student will do here. From an admission level, purely deciding who to accept and not, this is a level playing field to help us decide.

In terms of **curiosity**, I think when the student does their day visit, this is part of the visitor report, so this is where we would see that. This is coming from the host teachers.

**Creativity** can come out in the interview in how they answer certain questions, you know, I try to get to know their character through the interview, but there are also ways to pick up on what kind of learner they are. The interview can be pretty telling.

Within the affective domain, Admission Directors mainly identify these attributes during the interview process and through teacher feedback. This is what they had to say:

I think the **affective** attributes are the ones you pick on in an interview and how will a teacher respond to these attributes in their feedback and recommendation of the student?

**Humor** is really important and I definitely look for that because I think that a kid who has a sense of humor is comfortable with themself. It doesn't have to be cracking jokes, but it is just that sense that they can smile and enjoy life and other people. I'll look for that in the interview and when we meet in the morning or at a school fair.

I think that awareness and concern for others is really important and kind of ties in with **emotional stability**. I am going to look for this in the teacher recommendation forms. If I see that's checked "below average" then that is a major red flag and I will call that teacher and question why. Sometimes the teachers see it in a different way so you really need some clarity. It may be that the child is introverted or quiet and they are not quick to join the group or participate. If a child has no empathy, that is a concern.

As expected, a similar theme was noted within the **behavioral domain** in that attributes were consistently identified during the interview process or through teacher feedback during the applicants visit day. Although, it is important to note that several of the responses identify that the non-cognitive attributes are more difficult to quantify and measure and there seems to be a discomfort with that. The admission directors had the following to say:

> **Collaborative skills** are absolutely critical, very critical to our school, and is something I look for and ask about during the interview. I would put that as one of the most important.
>
> As we look at 21st century skills, to be able to work with your classmates is critical. If you couldn't do that or didn't want to, I don't think that we would be the right school for you. **Collaboration** is one of those lifelong skills. I will look for this in our teacher feedback form the visit day.
>
> The **ability to listen** is really big, but we try to make it more about the ability to listen to peers. So if you have a kid who is a great listener, but he's only listening to teachers, that's not going to correlate with our perceived importance of awareness of others.
>
> **Ethical behavior and integrity**: How do you measure that? Again, you are going to see certain behavior in an interview and you're gonna look at the teacher recommendations, possibly following up on these. Sometimes it's what the recommendations DON'T say.
>
> With **engagement**, we are going to pay close attention to how the applicant is answering our questions during the interview process, is it one word, are they asking questions back?
>
> Measuring attributes during admission process: it's mainly all qualitative. We have set questions that we ask in the interviews and on the application as well. We give our applicants two different choices for an essay. One of them is kind of about failure again and the other is about critical thinking and 21st century skills and ultimately use that as an indicator of what they are saying. Again, older kids can game it. They can tell you what they think you want to hear and not necessarily what they believe.
>
> Measuring those non-cognitive attributes are tricky! It's one of those things that's totally qualitative in our interview notes and then when we meet as a committee to discuss a file. When you spend time with a kid on campus you can kind of tell the kids who either have "it" or don't. It's totally qualitative and subjective to the person

> who spends the most time with them. We do give kids a score on their overall character, but that includes things like teacher recommendations, coming from people who really know them. So while we don't necessarily have a great measurement tool for non-cognitive attributes, we do value them. I know that's a risky way of going about these things.
>
> If a coach meets with a visitor or the band director, the tour guides as well, we follow up with these people to get their feedback. That's important to us, but it's very unofficial in a lot of ways.
>
> I really want to understand that they can academically do the work, that they have the social/emotional capability to be successful here. Feedback from the faculty, spending time with the parents - all of these pieces are important. Ultimately we are just looking for that red flag.
>
> I think being a **good listener** is really important. Most people really just want to tell their story to you and if you can listen you can pick up on the things that might be a concern and try to dig into it as much as you can, you can get a pretty good read on a kid.

Collectively, the interviews provided an opportunity to learn the perspectives of Admission Directors regarding non-cognitive attributes that lead to students academic success. Within the **behavioral** domain, **twenty-first century skills** were identified as important skills for students to possess to find academic success in an independent school setting. Specifically, Admission Directors identified **collaboration, ability to listen, ethical behavior** and **integrity** as attributes they look for in their applicants.

## Summary

The confirmatory factor analysis determined 14 of the 30 attributes to fit the proposed three factor model, while the others were removed from the analysis due to poor fit. The attributes which remained included critical thinking, creativity, curiosity, problem solving, resilience, adaptation, task commitment, ability to listen, intrinsic motivation, self-confidence in academic skills, emotional stability, perceived importance of education, passion for school, and interest in school. The content analysis revealed

a pattern of participants reporting that standardized admission test scores are just one component to the admission process. When discussing the importance of attributes for student academic success, the Admission Directors' responses were clustered (Krippendorf, 2004) by the cognitive, affective and behavioral domains. Several of the responses identify that the non-cognitive attributes are more difficult to quantify and there seems to be a discomfort with that. There was significant agreement between the attributes identified within the confirmatory factor analysis and the admission director interviews, while additional attributes were also identified as important to academic success (examples include: communication skills, poise and maturity, self-advocacy, and perseverance).

## References


Adams, C. (2012, November 14) *Education Week*, *(32)*12, 1.

American Educational Research Association. (1999). *Standards for educational and psychological testing* (2nd ed.). Washington, DC: Author.

Bandura, A. (1977). Self-efficacy: Toward a unifying theory of behavioral change. *Psychological Review, 84*(2), 191-215.

Bandura, A. (1986). *Social foundations of thought and action: A social cognitive theory.* Upper Saddle River, NJ: Prentice Hall.

Bandura, A. (1993). Perceived self-efficacy in cognitive development and functioning. *Educational Psychologist, 28*(2), 117-148.

Bandura, A. (1994). Self-Efficacy. In V. S. Ramachaudran (Ed.), *Encyclopedia of Human Behavior, 4*, 71-81. Retrieved from http://www.des.emory.edu/mfp/BanEncy.html

Bandura, A. (1997). *Self-efficacy: The exercise of control.* New York, NY: W. Freeman.

Chaffer Schroeder, K. (2011, Sept.). Diving into data. The Chronicle of Higher Education. Retrieved from http://chronicle.com/blogs/headcount/diving-into-data/28788

Costa, A., & Kallick, B. (2000). *Discovering and exploring habits of mind.* Alexandria, VA: Association for Supervision and Curriculum Development.

Gardner, H. (1999). *Intelligence reframed: Multiple intelligences for the 21st century.* New York, NY: Basic Books.

Hayes-Jacobs, H. (2010). *Curriculum 21: Essential education for a changing world.* Alexandria, VA: ASCD.

Heaven, P. C., & Ciarrochi, J. (2012). When IQ is not everything: Intelligence, personality, and academic performance at school. *Personality and Individual Differences.* Retrieved from http://dx.doi.org/10.1016/j.paid.2012.04.024

Houle, D., & Cobb, J. (2011). *Shift Ed: A call to action for transforming K-12 education.* Thousand Oaks, CA: Corwin.

Krippendorff, K., (2004). *Content analysis: An introduction to its methodology* (2nd Thousand Oaks, CA: Sage Publications.

Marsh, J., Pane, J. F., Hamilton, L. S. (2006). *Making sense of data-driven decision making in education: Evidence from recent RAND research.* RAND Education, Occasional paper.

McCoach, D. B., Gable, R. K., & Maduras, J. P. (2013). *Instrument development in the affective domain*. New York, NY: Springer.

NAIS (n.d.). *The ins and outs of testing.* Retrieved from http://www.nais.org/ indexPrint.cfm?print=Y&ItemNumber=149221

Pajares, F. (1996). Self-efficacy beliefs in academic settings. *Review of Educational Research, 66*(4), 543-578. Retrieved from http://www.des.emory.edu/mfp/ PajaresSE1996.html

Parker, J. D. A., Creque, R. E., Barnhart, D. L., Irons Harris, J., Majeski, S. A., Wood, L. M., Bond, B. J., & Hogan, M. J. (2004). Academic achievement in high school: does emotional intelligence matter? *Personality and Individual Differences, 37,* 1321-1330.

Patton, M. Q. (2002). *Qualitative research & evaluation methods.* Thousand Oaks, CA: Sage Publications, Inc.

Pink, D. (2006). *A whole new mind: Why right-brainers will rule the future.* New York, NY: Riverhead Books.

Robinson, K. (2001). *Out of our minds: Learning to be creative.* Westford, MA: Courier Westford, Inc.

Rubin, H., & Rubin, S. (2005). *Qualitative interviewing: The art of hearing data.* Thousand Oaks, CA: Sage Publications.

Schunk, D. H. (1982). Effects of effort attributional feedback on children's perceived self-efficacy and achievement. *Journal of Educational Psychology, 74*, 548-556.

Spady, W., & Schwann, C. (2010). *Learning communities 2.0: Educating in the age of empowerment.* Latham, MD: Rowman & Littlefield Education.

Sternberg, R. J. (1999). The theory of successful intelligence. *Review of General Psychology, 3*(4), 292-316.

Sternberg, R. J., & Grigorenko, E.L. (2000). *Teaching for successful intelligence*. Arlington Heights, IL: Skylight.

Sternberg, R. J., & The Rainbow Project Collaborators (2006). The rainbow project: Enhancing the SAT through assessments of analytical, practical, and creative skills. *Intelligence, 34*(2006), 321-350.

Sternberg, R. J. (2007). Finding students who are wise, practical, and creative. *Chronicle of Higher Education, 53*(44), B11.

Sternberg, R. J. (2009, fall). Wisdom, intelligence, and a new model for creativity synthesized. *Liberal Education.* Retrieved from http://www.aacu.org/liberaleducation/le-fa09/documents/LE-FA09_Sternberg.pdf

Sternberg, R. J. (2010). WICS: A new model for school psychology. *School Psychology International, 31*(6), 599-616.

Tough, P. (2012). *How children succeed: Grit, curiosity, and the hidden power of character.* New York, NY: Houghton Mifflin Harcourt.

Wagner, T. (2008). *The global achievement gap.* New York, NY: Basic Books.

# Appendix A

## Student Attribute Survey

### Predictors of Success in Independent Schools - Student Attribute Survey

#### Welcome!

This study is being conducted to examine the attributes that admission counselors find important for student academic success within the cognitive, affective, and behavioral domains. You will be asked to rate the importance of the attributes from "not important" to "very important" within the three domains listed below in the student attribute survey.

This will only take 5 minutes of your time.

At the end of the survey please click "done" for your input to be included.

#### I. Cognitive Attributes

Cognitive attributes relate to an individual's content knowledge, as well as their intellectual ability and skills.

How important are the following student attributes, as predictors of academic success, in the independent school in which you work?

Example: If you believe that it is very important for a student to possess critical thinking skills, in order to find academic success at the school where you work, you would select "Very Important" for critical thinking skills.

***1. COGNITIVE Attributes:**

| | Not Important | Of Little Importance | Moderately Important | Important | Very Important |
|---|---|---|---|---|---|
| Critical thinking skills | ◯ | ◯ | ◯ | ◯ | ◯ |
| Verbal skills | ◯ | ◯ | ◯ | ◯ | ◯ |
| Quantitative skills | ◯ | ◯ | ◯ | ◯ | ◯ |
| Reading skills | ◯ | ◯ | ◯ | ◯ | ◯ |
| Creativity | ◯ | ◯ | ◯ | ◯ | ◯ |
| Curiosity | ◯ | ◯ | ◯ | ◯ | ◯ |
| Problem solving | ◯ | ◯ | ◯ | ◯ | ◯ |
| Decision making ability | ◯ | ◯ | ◯ | ◯ | ◯ |

Other (please specify any other VERY IMPORTANT attributes within the Cognitive domain)

#### II. Affective Attributes

Affective attributes relate to an individual's emotions and the feelings and emotions of those around them.

How important are the following affective attributes, as predictors of academic success, in the independent school in which you work?

## Predictors of Success in Independent Schools - Student Attribute Survey

***2. AFFECTIVE Attributes:**

| | Not Important | Of Little Importance | Moderately Important | Important | Very Important |
|---|---|---|---|---|---|
| Conscientiousness | ◯ | ◯ | ◯ | ◯ | ◯ |
| Interest in school | ◯ | ◯ | ◯ | ◯ | ◯ |
| Intrinsically motivated | ◯ | ◯ | ◯ | ◯ | ◯ |
| Self-confidence in academic skills | ◯ | ◯ | ◯ | ◯ | ◯ |
| Passion for school | ◯ | ◯ | ◯ | ◯ | ◯ |
| Emotional Stability | ◯ | ◯ | ◯ | ◯ | ◯ |
| Perceived importance of education | ◯ | ◯ | ◯ | ◯ | ◯ |
| Humor | ◯ | ◯ | ◯ | ◯ | ◯ |
| Awareness/concern for others | ◯ | ◯ | ◯ | ◯ | ◯ |
| Self-awareness | ◯ | ◯ | ◯ | ◯ | ◯ |

Other (please specify any other VERY IMPORTANT attributes within the Affective domain)

### III. Behavioral Attributes

Behavioral attributes relate to an individual's physical involvement, interactions, cooperation, and adaptability.

How important are the following behavioral attributes, as predictors of academic success, in the independent school in which you work?

## Predictors of Success in Independent Schools - Student Attribute Survey

***3. BEHAVIORAL Attributes:**

| | Not Important | Of Little Importance | Moderately Important | Important | Very Important |
|---|---|---|---|---|---|
| Study skills | ○ | ○ | ○ | ○ | ○ |
| Social skills | ○ | ○ | ○ | ○ | ○ |
| Communication skills | ○ | ○ | ○ | ○ | ○ |
| Ability to organize tasks | ○ | ○ | ○ | ○ | ○ |
| Inquisitive nature | ○ | ○ | ○ | ○ | ○ |
| Ability to listen | ○ | ○ | ○ | ○ | ○ |
| Task commitment | ○ | ○ | ○ | ○ | ○ |
| Ethical behavior/integrity | ○ | ○ | ○ | ○ | ○ |
| Cooperation | ○ | ○ | ○ | ○ | ○ |
| Adaptation | ○ | ○ | ○ | ○ | ○ |
| Collaborative skills | ○ | ○ | ○ | ○ | ○ |
| Resilience | ○ | ○ | ○ | ○ | ○ |

Other (please specify any other VERY IMPORTANT attributes within the Behavioral domain)

### Final Question!

**4. Is there anything else related to the three domains (cognitive, affective, and behavioral) that you feel would contribute to predictors of student success in an independent school?**

### Thank you!

Thank you for taking the time to complete the Student Attribute Survey.

If you would like to be entered for a chance to win a $50 Visa Gift Card, please email meghankiley@wheelerschool.org with your name and address by December 1, 2012.

If you would like to receive information regarding my final research results, please email meghankiley@wheelerschool.org and specify that you are interested in research results. I will email the results to you when they are available.

Thank you again for your time!

## Appendix B

Importance Rating, Mean and Standard Deviation for Attributes within the Student Attribute Survey, Ranked by Mean

| | Attributes | | Importance Rating 1 | 2 | 3 | 4 | 5[a] | *M* | *SD* |
|---|---|---|---|---|---|---|---|---|---|
| Cognitive | | | | | | | | **4.29** | 0.44 |
| C-1 | Critical Thinking | *f* | | 1 | 6 | 81 | 142 | 4.58 | 0.57 |
| | | % | | 0.4 | 2.6 | 35.2 | 61.7 | | |
| C-4 | Reading | *f* | | | 11 | 96 | 123 | 4.49 | 0.59 |
| | | % | | | 4.8 | 41.7 | 53.5 | | |
| C-7 | Problem Solving | *f* | | 2 | 15 | 115 | 98 | 4.34 | 0.640 |
| | | % | | 0.9 | 6.5 | 50.0 | 42.6 | | |
| C-2 | Verbal | *f* | | | 22 | 111 | 97 | 4.33 | 0.64 |
| | | % | | | 9.6 | 48.3 | 42.2 | | |
| C-6 | Curiosity | *f* | 1 | 2 | 29 | 95 | 103 | 4.29 | 0.75 |
| | | % | 0.4 | 0.9 | 12.6 | 41.3 | 44.8 | | |
| C-3 | Quantitative | *f* | | | 29 | 136 | 65 | 4.16 | 0.62 |
| | | % | | | 12.6 | 59.1 | 28.3 | | |
| C-8 | Decision making | *f* | | 1 | 40 | 115 | 74 | 4.14 | 0.70 |
| | | % | | 0.4 | 17.4 | 50.0 | 32.2 | | |
| C-5 | Creativity | *f* | | 2 | 53 | 116 | 56 | 3.97 | 0.75 |
| | | % | | 2.2 | 23.0 | 50.4 | 24.3 | | |

(Continued)

Importance Rating, Mean and Standard Deviation for Attributes within the Student Attribute Survey, Ranked by Mean (continued)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Affective | | | | | | | | **4.03** | 0.47 |
| A-10 | Interest in School | *f* | | 1 | 17 | 94 | 115 | 4.42 | 0.650 |
| | | % | | 0.4 | 7.4 | 40.9 | 50.0 | | |
| A-9 | Conscientiousness | *f* | | 1 | 18 | 118 | 90 | 4.31 | 0.63 |
| | | % | | 0.4 | 7.8 | 51.3 | 39.1 | | |
| A-11 | Internal Motivation | *f* | | 1 | 31 | 100 | 95 | 4.27 | 0.70 |
| | | % | | 0.4 | 13.5 | 43.5 | 41.3 | | |
| A-17 | Awareness/Concern for others | *f* | 2 | 3 | 31 | 109 | 82 | 4.17 | 0.78 |
| | | % | 0.9 | 1.3 | 13.5 | 47.4 | 35.7 | | |
| A-14 | Emotional Stability | *f* | | 2 | 30 | 123 | 72 | 4.17 | 0.68 |
| | | % | | 0.9 | 13.0 | 53.5 | 31.3 | | |
| A-15 | Perceived Importance of Education | *f* | 1 | 4 | 44 | 125 | 53 | 3.99 | 0.74 |
| | | % | 0.4 | 1.7 | 19.1 | 54.3 | 23.0 | | |
| A-18 | Self-Awareness | *f* | 2 | 5 | 48 | 119 | 53 | 3.95 | 0.78 |
| | | % | 0.9 | 2.2 | 20.9 | 51.7 | 23.0 | | |
| A-13 | Passion for School | *f* | | 6 | 58 | 114 | 49 | 3.91 | 0.76 |
| | | % | | 2.6 | 25.2 | 49.6 | 21.3 | | |
| A-12 | Self-confidence in Academic Skills | *f* | | 9 | 56 | 133 | 29 | 3.80 | 0.70 |
| | | % | | 3.9 | 24.3 | 57.8 | 12.6 | | |
| A-16 | Humor | *f* | 4 | 29 | 92 | 87 | 15 | 3.35 | 0.85 |
| | | % | 1.7 | 12.6 | 40.0 | 37.8 | 6.5 | | |

(continued)

Importance Rating, Mean and Standard Deviation for Attributes within the Student Attribute Survey, Ranked by Mean (continued)

| | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Behavioral | | | | | | | | **4.14** | 0.47 |
| B-26 | Ethical Behavior | *f* | 2 | 5 | 12 | 65 | 139 | 4.50 | 0.78 |
| | | % | 0.9 | 2.2 | 5.2 | 28.3 | 60.4 | | |
| B-24 | Ability to Listen | *f* | | | 21 | 115 | 87 | 4.30 | 0.63 |
| | | % | | | 9.1 | 50.0 | 37.8 | | |
| B-19 | Study Skills | *f* | | 3 | 29 | 101 | 90 | 4.25 | 0.72 |
| | | % | | 1.3 | 12.6 | 43.9 | 39.1 | | |
| B-30 | Resilience | *f* | | 2 | 36 | 107 | 78 | 4.17 | 0.72 |
| | | % | | 0.9 | 15.7 | 46.5 | 33.9 | | |
| B-27 | Cooperation | *f* | 1 | 2 | 31 | 117 | 72 | 4.15 | 0.72 |
| | | % | 0.4 | 0.9 | 13.5 | 50.9 | 31.3 | | |
| B-29 | Collaborative Skills | *f* | | 4 | 37 | 108 | 74 | 4.13 | 0.75 |
| | | % | | 1.7 | 16.1 | 47.0 | 32.2 | | |
| B-25 | Task Commitment | *f* | | | 32 | 129 | 62 | 4.13 | 0.64 |
| | | % | | | 13.9 | 56.1 | 27.0 | | |
| B-21 | Communication Skills | *f* | | 3 | 35 | 119 | 66 | 4.11 | 0.70 |
| | | % | | 1.3 | 15.2 | 51.7 | 28.7 | | |
| B-28 | Adaptation | *f* | | 2 | 37 | 127 | 57 | 4.07 | 0.67 |
| | | % | | 0.9 | 16.1 | 55.2 | 24.8 | | |
| B-22 | Ability to Organize | *f* | | 1 | 40 | 128 | 54 | 4.05 | 0.66 |
| | | % | | 0.4 | 17.4 | 55.7 | 23.5 | | |
| B-23 | Inquisitive Nature | *f* | 1 | 3 | 55 | 104 | 60 | 3.98 | 0.78 |
| | | % | 0.4 | 1.3 | 23.9 | 45.2 | 26.1 | | |
| B-20 | Social Skills | *f* | | 8 | 65 | 111 | 39 | 3.81 | 0.70 |
| | | % | | 3.5 | 28.3 | 48.3 | 17.0 | | |

[a] *Importance Rating: 1 = Not Importance, 2 = Of Little Importance, 3 = Moderately Important, 4 = Important, 5 = Very Important*