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What does 'Success in Academics' Mean to College Students? A Semantic Differential Analysis for Determining Constructs of the Concept

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ABSTRACT

Key words: *Semantic differential analysis, semantic space, success in academics, factor analysis*

In social science and behavioural science mostly concepts are subjective in nature which cannot be easily dealt with the traditional positivistic and approaches of research. Present paper is a case of demonstration of Semantic Differential for defining meanings of undefined and subjective matter/issue/phenomenon. Investigator chose to find meaning of 'Success in Academics' from college students' point of view. Semantic differential analysis involves construction of semantic differential by covering the concept by selection of range of possible sub concepts which are responded to in terms of bipolar scales (bearing opposite adjectives on two extremes) separated by spaces used for responding as magnitude of the response. Responses were scored and converted in to matrices of concepts x scales and summed for all the forty students and put to Principal component factor analysis. Three factors were obtained which have been named as 'Abstract Outcomes' 'Mixed Outcomes' and 'Concrete outcomes'. Abstract outcomes amounts unconventional meanings of 'success in academics', Mixed outcomes points towards outcomes which may or may not be concrete and Concrete outcomes represent things like academic achievement, popularity and personality grooming.

Introduction

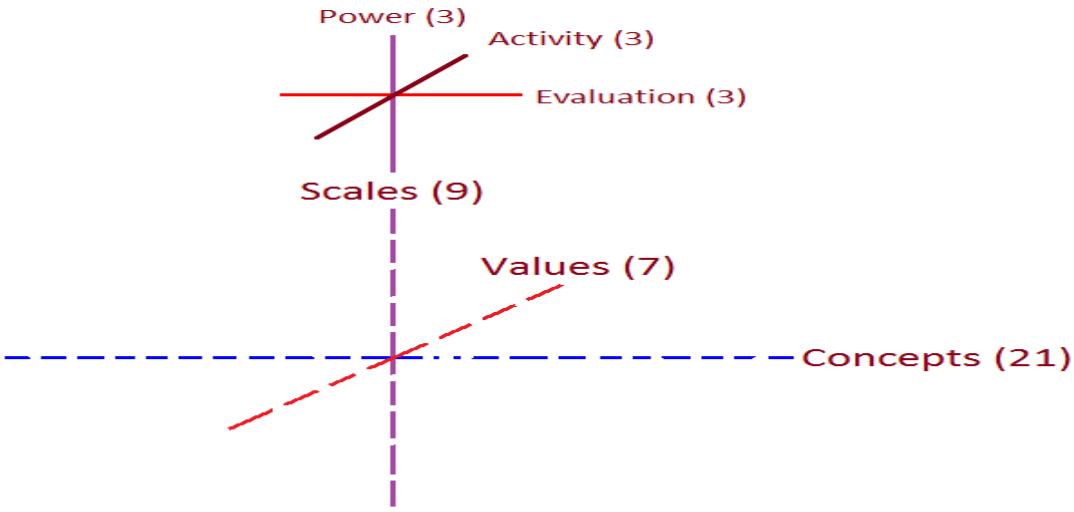
Success is the most satisfying experience for a human being, especially true for students at college age. But at the same time success is not identical for all the human beings even in same domain. Education and especially academics is not exception to it. We do not undertake education for same reason as our priorities differ with our context. Students are found to have

strong desire to perform in academics, but not for same reason among all the students. Some desire to get a degree, others for popularity and still others for building and progression in a career. If we keep on adding these objectives we may end up with hundreds of objectives for 'success in academics'. This may create more confusion than solving the issue. We here intended to spread the issue as much as possible by taking number of possible dimensions of the concept 'success in academics' and tested on a sample of participants followed by merger of these dimensions to make some concrete constructs of the concept. This is always a methodology of dealing a subjective issue as one under investigation. There can be number of methodologies to deal such problem, but the best suited are Q-methodology & Semantic Differential Analysis (SDA). Both these methodologies follow an ipsative (forced) choice method of data collection, but in different formats and method of analysis. Investigator preferred the latter by virtue its better ability to produce variation in responses and ease of data collection, calculations and interpretation.

Semantic Differential Analysis

Osgood is credited for development and demonstration of use of Semantic Differential Analysis/Technique to handle the subjective and affective issues which could not be defined objectively as in case of physical sciences. SDA is used to find 'connotative' (not denotative) meanings of the concept which are concerned with perceptions rather than dictionary meanings. For instance names of vehicle models are associated with Jaguar, Leopard, and Cheetah for connotative meanings rather than denotative ones. Thus it was a breakthrough to investigate issues in the field of social sciences, behavioral sciences, cultural studies and the like. Semantic Differentials include creating of semantic spaces by virtue of responses of the participants. Being named as space it needs to have three dimensions- concept, scales and values on the scale. Concepts rather should be named as sub-concepts are possible division of the subject (concept) under investigation. Greater the number of sub-concepts better will be the coverage of the concept under study. Also there is better possibility of using factor analysis for deriving constructs of the concept. Concepts are further divided in terms of scales having bipolar adjectives on two extremes of each scale. A scale is divided in spaces which a respondent needs to choose as per his/her alliance with the concept. Actually theses spaces decide respondents' strength of alliance positively or negatively with the scale in respect of a sub-concept. Scales are actually further trifurcated in to purview of Evaluation, Power (potency) and Activity. Evaluation amounts to making a judgment for existence-nonexistence and quality extent, potency amounts to power, influence, and effect of the concept, and

activity amounts to action, performance and deed. Pictorial representation of structure of Semantic Differential for proposed study is presented below.



Three Dimensions of Semantic Differential Scale
(semantic space)

Schematic representation of Semantic differential tool for proposed study has been given below.

For me 'Success in Academics" is matter of .....

CONCEPT (e.g. Knowledge Attainment)

Adjective	**Spaces**							**Adjective**
True	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	False
Valueless	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	Valuable
Important	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	Trivial
Weak	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	Strong
Big	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	Little
Tiny	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	Immense
Attractive	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	Repulsive
Regressive	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	Progressive
Create	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	_ _ _ _	Destroy

Objectives

This investigation is aimed at attaining following objectives:

- Making of factors of the concept using Factor analysis followed by Varimax rotation.
- Dubbing (naming) of factors as per nature of the constituent concepts found by using Factor analysis.
- Creating semantic space using obtained factors.
- Evaluating utility of SDA methodology for handling subjective issues on the subject under investigation.

Sample for the Study

As Semantic differential analysis is a small sample technique only forty college students has been taken as participants. The type o sampling has been snow ball sampling.

Tool for Data Collection

Semantic Differential developed by Handa (2017) as a part of their master's degree in education has been used for data collection.

Concepts in the semantic differential used for the study

Concept Designation	Concept	Concept Designation	Concept
A	Prestige	L	Competence attainment
B	Fulfilment	M	Assurance to existence
C	Knowledge attainment	N	Status building
D	Career Progression	O	Values inculcation
E	Achievement	P	Motivation for learning
F	Fame (Popularity)	Q	Preparation for life
G	Return for spending	R	Pleasure of learning
H	Personality refinement	S	Satisfaction
I	Winning relations	T	Cognitive victory
J	Enlightenment	U	Wisdom attainment
K	Confidence for performance		

Administration of Semantic Differentials

Semantic differential has been administered on forty college students in face to face situation. Although study involves only forty participants but the amount of data collected is quite large for making meaningful conclusions. Every participant has contributes one hundred eighty nine entries (21*9 = 189) out of possible one thousand three hundred twenty three (21*9*7 = 1323) possible responses.

Scoring of the Data

Following scheme is used for scoring of semantic differential.

Adjective	**Spaces**							**Adjective**
Important	7	6	5	4	3	2	1	Trivial
True	7	6	5	4	3	2	1	False
Valueless	1	2	3	4	5	6	7	Valuable
Tiny	1	2	3	4	5	6	7	Immense
Big	7	6	5	4	3	2	1	Little
Weak	1	2	3	4	5	6	7	Strong
Create	7	6	5	4	3	2	1	Destroy
Regressive	1	2	3	4	5	6	7	Progressive
Attractive	7	6	5	4	3	2	1	Repulsive

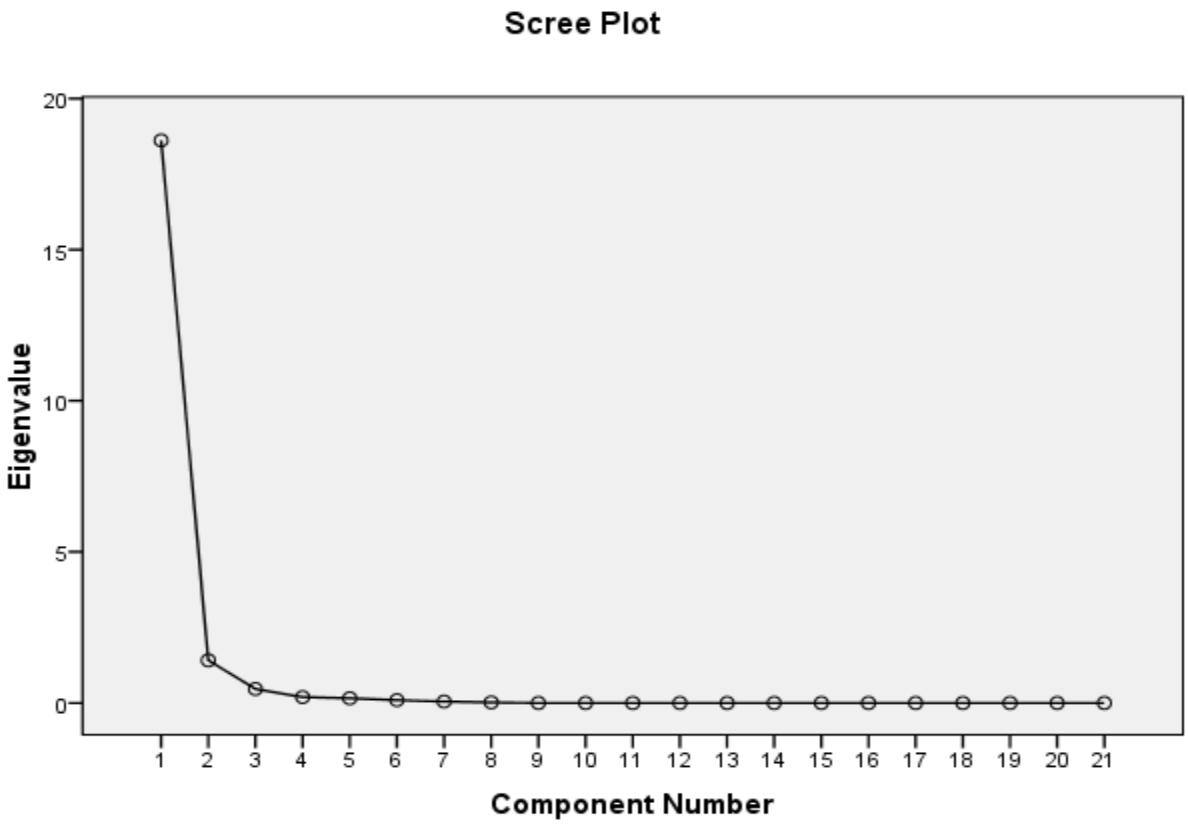
Data matrix of forty college students

For each participant a data matrix of sub-concepts x scales is obtained as shown below.

	A	**B**	**C**	**D**	**E**	**F**	**G**	**H**	**I**	**J**	**K**	**L**	**M**	**N**	**O**	**P**	**Q**	**R**	**S**	**T**	**U**
S1	7	6	7	7	6	7	5	7	7	7	6	6	6	7	7	7	7	7	6	7	7
S2	7	7	7	6	6	7	5	7	7	7	6	6	6	6	7	7	6	7	6	6	7
S3	7	7	7	7	6	6	5	6	7	6	6	6	5	6	7	7	7	7	6	6	7
S4	7	7	7	6	6	6	5	6	7	6	6	6	6	7	7	7	6	7	6	6	6
S5	7	6	6	6	5	6	5	6	6	6	6	6	6	7	7	7	7	7	6	6	6
S6	7	7	6	6	6	7	5	6	6	6	6	6	6	7	7	6	5	7	6	7	7
S7	6	7	7	7	6	7	5	7	7	6	6	6	6	7	7	7	6	7	6	7	7
S8	6	7	7	7	6	7	5	6	7	7	6	6	6	7	7	7	7	7	6	7	7
S9	6	5	6	6	5	5	5	6	6	5	6	6	5	5	7	7	6	7	6	7	6

Factor Analysis

Averaged score of all the forty participants in respect of all the twenty one concepts in terms of nine scales were put to Principal Component Factor Analysis followed by varimax rotation using SPSS-16. Solution obtained in respect of restriction of eigen values>1 could only produce two factors after 3 iterations. The fact is very much clear from then scree plot. But then it was again tried to get maximum factors to make out some factors for the concept. SPSS was instructed to get at least five factors, but only three factors with significant loadings on the concept could be obtained after seven iterations. The third factor actually was a part of previously obtained two factors but could reasonably make independent existence. First factor could account for maximum variance (88.646) where as other two factors accounted for only 6.726 and 2.200 variance thus totaling to explain 97.573. After varimax rotation explanation of variance could be redistributed among the three factors, it was improved and could explain 49.338, 35.817 and 12.418 percent of variance respectively.



Factor loadings for factors obtained before and after rotation are shown in tables given below followed by extracted factors.

Component Matrix[a]

	Components		
Concept			
A	1	2	3
B	.956	.015	.244
C	.985	-.090	.104
D	.965	-.163	.077
E	.980	-.099	.156
F	.954	-.283	-.065
G	.924	-.156	-.175
H	.804	.555	.094
I	.950	-.212	-.176
J	.916	-.352	.147
K	.938	.111	-.244
L	.980	-.070	-.152
M	.911	.378	.065
N	.886	.450	.026
O	.995	.007	-.041
P	.953	-.273	-.020
Q	.945	-.287	.062
R	.939	-.105	.281
S	.914	.356	-.157
T	.971	.101	-.195
U	.965	-.071	-.126

Extraction Method: Principal Component Analysis.
Rotation Method: Varimax with Kaiser Normalization.

a. Rotation converged in 7 iterations.

Rotated Component Matrix

	Components		
Concept			
A	1	2	3
B	1	2	3
C	.758	.623	.099
D	.801	.535	.246
E	.823	.462	.269
F	.819	.534	.196
G	.847	.337	.406
H	.713	.400	.491
I	.268	.931	.155
J	.766	.371	.504
K	.926	.296	.198
L	.537	.606	.544
M	.706	.505	.483
N	.446	.852	.229
O	.372	.886	.253
P	.704	.592	.380
Q	.853	.351	.363
R	.881	.350	.284
S	.832	.526	.065
T	.394	.799	.440
U	.582	.626	.511

Factors with factor loadings and constituent concepts of factors

Factor loadings					Composition and dubbing of factors		
Concept	Factor I	Factor II	Factor III		Factor	Concepts	Name of the factor
A	0.758				Factor I	A, B, C, D, E, F, H, I, K, N, O, P, Q & T	Abstract Outcomes
B	0.801				Factor II	G, J, L, M, R, S & U	Mixed Outcomes
C	0.823				Factor III	E, F, H, O	Concrete Outcomes
D	0.819						
E	0.847		0.406				
F	0.713		0.491				
H	0.766		0.504				
I	0.926						
K	0.706						
N	0.704						
O	0.853		0.363				
P	0.881						
Q	0.832						
T	0.705						
G		0.9310					
J		0.606					
L		0.852					
M		0.886					
R		0.799					
S		0.626					
U		0.836					

Explanation of factors

Factor I: Abstract Outcomes- first and most important factor which explains 49.338 percent variance. Factor consisted of sub-concepts A (Prestige), B (Fulfillment), C (Knowledge

attainment), D (Career Progression), E (Achievement), F (Fame), H (Personality refinement), I (Winning relations), K (Enlightenment), N (Status building), O (Values inculcation), P (Motivation for learning), Q (Preparation for life) & T (Cognitive victory). These concepts are in decreasing order of factor loading and hence importance is given to first few sub-concepts for naming the factor. Prestige, fulfillment and knowledge attainment are usually not thought of as meaning of 'success in academics'. It means students definitely want to succeed in academics to earn prestige, fulfillment, knowledge attainment and the like.

Factor II: Mixed Outcomes- is the second factor which accounts for 35.817 percent variance. Factor consisted of sub-concepts G (Return for spending), J (Enlightenment), L (Competence attainment), M (Assurance to existence), R (Pleasure of learning), S (Satisfaction) & U (Wisdom attainment). This factor is consisted of sub-concepts which belong to both concrete as well as abstract outcomes. Return for spending, competence attainment and assurance to existence could be classified as concrete outcomes whereas enlightenment, pleasure of learning, satisfaction and wisdom attainment fall in the category of abstract outcomes. Thus the best possible title for the factor should be 'mixed outcomes'.

Factor III: Concrete Outcomes- is least important which accounts for 12.418 percent variance. Factor consisted of sub-concepts E (Achievement), F (Fame), H (Personality refinement) & O (Values inculcation). Out of four three sub concepts i.e. Achievement, Fame, Personality refinement are concrete outcomes, which suggest the title of the factor. College students feel that unless until they achieve in the form of marks, grades, degree etc. they do not define it as academic success. Other issue may be students want clear improvement in personality and they need their popularity should expand by virtue of academic success.

Conclusion

- Semantic differential analysis could be used very well for handling subjective issues like one investigated.
- College students consider concrete, abstract and mixed outcomes as indicators of 'success in academics'.
- Only three factors could be obtained for the concept under investigation. Reason may be that sub concepts were not really of variety, sub concepts were no sufficient in number, selection of participants might be homogeneous and factor analysis might not be the right choice of statistics in comparison to cluster analysis.
- We could establish meaning of 'success in academics' in very generalized form to say that nothing unique could be invented.

Educational Significance of the Study

Study has been conducted on two grounds, one to find meanings of the term 'success in academics' second about demonstration of utility of semantic differential methodology. As far as methodology is concerned it is very much heuristic, explorative, innovative and creative, whereas results found were only satisfactory, but at the same time it is recommended that methodology could be explored for number of such subjective issues with more rigorous methods and techniques. Also such issues should be searched thoroughly for theoretical background to get better results.

References

1. Carroll, J. B. (1959). Review of the Measurement of Meaning, *Language, 35*, 58-77.

2. Darnell, D.K. (1966). Concept Scale Interaction in the Semantic Differential, *Journal of Communications, 16*(2), 104-115.

3. Gable, R. K., & Wolf, M. E. (1993). *Instrument development in the affective domain* (2nd ed.). Boston, MA: Kluwer Academic.

4. Heise, D.R. (1969). Some Methodological Issues in Semantic Differential Research, *Psychological Bulletin (72)*6, 406-422.

5. Kerlinger, F.N. (1973, 1978). *Foundations of Behavioral Research* (second edition), New York: olt, Rinehart and Winston, Inc.

6. Kline, P. (1994). *An easy guide to factor analysis*. New York, NY: Routledge.

Kuh, G. D., Kinzie, J., Schuh, J. H., Whitt, E. J., & Associates, (2010). Student Success in College: Creating Conditions that matter. San Francisco, CA: Josey-Bass Publishing.

7. Kuh, G. D; Bridges, B. K. & Hayek, J.C. (2006) *What Matters to Student Success: A Review of the Literature.* Commissioned Report for the National Symposium on Postsecondary Student Success: Spearheading a Dialog on Student Success (NPEC), USA.

8. Landon Jr., E.L. (1971). Order Bias, the Ideal Rating, and the Semantic Differential, *Journal of Marketing Research, 8* (3), 375-78.

9. Nunnally, J. C. (1967) *Psychometric Theory*, New York: McGraw-Hill, Inc.

Oles, H. J.; Bolvin, J. O. (1972). The Reliability and Usability of a Semantic Differential Attitude Scale with Third through Fifth Grade Students. ERIC Number: ED067399

10. Osgood CE. (1962) Studies of the generality of affective meaning systems. *American Psychology, 17*, 10–28.

11. Osgood, C. E., Suci, G. J., & Tannenbaum, P. H. (1957). *The Measurement of Meaning.* Chicago, IL: University of Illinois Press.

12. Royce (1963) in Kline, P. (1994). *An Easy Guide to Factor Analysis*. New York, NY: Routledge.

Schriesheim, C.A. and Klich, N.R. (1991) Fiedler's Least Preferred Coworker (LPC) Instrument: An Investigation of Its True Bipolarity, *Educational and Psychological Measurement*, *51*(2), 305-315.

13. Sharpe, L.K. & Anderson, W.T. (1972). Concept-Scale Interaction in the Semantic Differential, *Journal of Marketing Research*, *9*(4), 432-434.

14. Verhegan, T. & Meents, S. (2007). A Framework for developing Semantic Differential in IS Research: Assessing the Meaning of Electronic Marketplace Quality (EMQ). Retrieved on Oct. 21, 016. URL: *https://www.researchgate.net/publication/4793619*

15. Weinreich, U. (1958). Travels Through Semantic Space, *Word*, *14*(2-3), 346-366.

Net sources:

http://pareonline.net/getvn.asp?v=20&n=5

http://www.indiana.edu/~socpsy/papers/AttMeasure/attitude..htm

http://www.indiana.edu/~socpsy/papers/AttMeasure/attitude..htm

https://en.wikipedia.org/wiki/Semantic_differential

https://nces.ed.gov/npec/pdf/kuh_team_report.pdf

https://www.researchgate.net/publication/4793619_A_Framework_for_Developing_Semantic_Differentials_in_IS_research_Assessing_the_Meaning_of_Electronic_Marketplace_Quality_EMQ

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