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## CONTENTS

Sr. No.	Articles	Page No.
1	Maternal Parenting Style and Problem Behavior of Children, <i>Antara Ghosh and Sunandini Banerjee</i>	1-9
2	Emotional Competence and Satisfaction with Life as Predictors of Psychosocial Well Being among Young Adults, <i>Shilpa Kamboj, Varsha Rani, Sarvdeep Kohli and Anjali Malik</i>	10-19
3	Emotional Intelligence: The Predictor of Resilience, <i>Farah Kidwai and Durlabh S Kowal</i>	20-27
4	A Comparative Study of Academic Resilience and Optimism among Students of Educated and Uneducated Parents, <i>Hema Kumari Mehar and A.V.S.Madnawat</i>	28-33
5	The Effect of Spiritual Practices on Resilience, <i>Harshitha Krishnaveti and Sritha Sandon</i>	34-45
6	Parental Encouragement and Self-Concept: A Study Based on Familial Variables, <i>R. Grace Sophia and A. Veliappa</i>	46-51
7	Impact of Social Support on Burnout among Indian School Teachers, <i>Neelam Kumari</i>	52-59
8	Major Barriers Affecting Teacher's Job Satisfaction in Addis Ababa: A Comparative Facility Based Study from Government and Private Secondary Schools from Arada Sub-City, Ethiopia <i>Messenger Assefa and Jemal Haidar</i>	60-71
9	Construct Validity of OCB Scale using Confirmatory Factor Analysis: An Empirical Analysis of Primary and High Schools, <i>Harinder Singh Gil and Deepika Gupta</i>	72-87
10	Development and Evaluation of Career Assessment scales: A content Validation Study, <i>Garima Srivastava, Kunal Singh Sandhu, Tanvi Bajaj, Reshma George Palackan, Arushi Sawhney, Tanya Sharma</i>	88-101
11	Quality of Work Life in Relation to Role Stress amongst Higher and Middle Level Jaipur Development Authority Employees, <i>Manasvee Dubey, Deepika Sharma and O.P.Sharma</i>	102-106
12	Home Environment and Mental Health: A Study among High School Students, <i>Shilpy Gupta and Neeru</i>	107-112
13	Locus of Control: A Comparative Study of Criminals and Non-Criminals, <i>Rupan Dhillon and Nitesh Kumar Jha</i>	113-123
14	Hardiness and Mental Health among Adolescen, <i>Meena Kumari and Nisha</i>	124-129
15	A Correlational Study of Worry and Emotion Regulation Deficits in Generalized Anxiety Disorder (GAD) patients, <i>Isha Khanna and Jyotsana</i>	130-135
16	General Mental Alertness of Different Sociometric Groups among Secondary School Students, <i>Shafieqa Bano</i>	136-145
17	Emotional Stability and Adjustment in Adolescents: A Comparative Study of Advantaged and Disadvantaged Groups, <i>Shabana Anjum, Jyotsana and Mahmood S. Khan</i>	146-152
18	Adolescent Sexuality and Sex Education: Parents' Perspective, <i>Madhurima, Arunima Gupta Amanpreet Singh</i>	153-160
19	Coping Strategies in Primary Caregivers of Intellectually Disabled Children, <i>Suman Hooda and Arunima Gupta</i>	161-168
20	Evolution of Psychotherapy: An Overview of the Western and Indian Contexts, <i>Maria Zafar, Megha, M and Pant.P</i>	169-178
21	Understanding Psycho-Social Pathways to Substance Abuse in Second Decade of Life: A Qualitative Approach, <i>Ishita Chauhan and S.N. Ghosh</i>	179-187
22	Exploring the Relationship between Character Strength and Learning Style amongst Youth: An ICT Approach, <i>Gajanand Gupta, S.K.Gupta and Sushila Pareek</i>	188-191
23	Moderating Effect of Emotion Regulation on the Relationship between Perceived Parenting Styles and Emotional Intelligence of Adolescents, <i>Nisha K and C Jayan</i>	192-200
24	Job Satisfaction and Motivation to Teach among Lower and Upper Secondary School In-Service Physics Teachers, <i>Shimeles Assefa</i>	201-217
25	Psychosocial Stressors and Life Satisfaction among Bureaucrats, <i>Gayatri Raina and Shivalika Sharma</i>	218-227



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## Development and Evaluation of Career Assessment scales: A content Validation Study

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### Abstract

The study assesses the content validity of career assessment tools built by CogitoHub: a career assessment centre. In context of the prevalent issue of talent mismatch, there is a need to create standardised psychometric tools that enable students to make informed decisions regarding career choices. The data for this research was collected from 234 industry and subject matter experts along with psychologists, statisticians and students from high school, and undergraduate and postgraduate studies. The findings indicate that the 4 tools designed for grades 8 - 11/12 have high face and content validity. The tools, namely, CogitoHub Tool 1 (CHT1), CogitoHub Tool 2 (CHT2), CogitoHub Tool 3 (CHT3) and CogitoHub Tool 4 (CHT4) were found to have high face validity. Further, CHT2 had content validity of 0.78, CHT3 had content validity of 0.85 (for each of Professional Orientation Statements scale and Subject Statements scale) and CHT4 had content validity of 0.84 (Job Family Statements scale).

**Keywords:** Career assessment, Content validity, Face validity, Talent mismatch

The developing world is experiencing a paradox – a state where unemployment is very high yet companies cannot find the talents they need – a scenario widely referred to as ‘talent mismatch’. A recent study by Pricewaterhouse Coopers in 2014 revealed that the growing skills gap has led to massive costs, almost up to \$150 billion, for the global economy (PwC, 2014). As per recent estimates released by the International Labor Organization, “on the one hand, 40 million workers in the industrialised world are unemployed, yet executives and managers tasked with hiring new workers often say they are unable to find the right people with the proper skills to fill their vacancies.” (Oxford Economics, Global Talent 2021, 2012).

This mismatch is also prevalent in the employed population- people who often find themselves in jobs that they cannot relate to. This unsurprisingly leads to unhappiness at work and frequent job shifts in a vast majority of the working

population. According to Deloitte’s Shift Index Survey, 80% of the people in the United States are dissatisfied with their jobs (Shontell, 2010). This was attributed to a lack of proactive approach in managing decisions about their education and career.

### Decision Making Process

As per Statistics Canada (2005), about one third of 25 year olds had made their career choice during their early twenties, with 15.9% having the same career expectations from age 21 and 16.0% from the age of 23. There was a lot of uncertainty in terms of their career choices for the remaining majority of 25 year olds. More than 13% of young adults were still undecided about a career at age 25, while almost 38.3% had decided to pursue a new career. This implies that there is a lot of confusion and lack of direction even at the age of 25, when formal education has completed. Some are unsure even after obtaining specialised education.

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According to Dada (2005), it is extremely common amongst today's youth to make career related decisions in a haphazard manner. Ike (1997) states that a large number of students are perplexed about what they want to do in their lives and the path they want to follow after school. Highlighting another important factor, Dobbins (2000) asserted that parents' career aspirations aid children in selecting occupational goals, influence their knowledge of occupations, and familiarise them with occupational roles and requirements.

Lack of proper guidance regarding careers and related interventions at school make it difficult for students to be effective in making decisions regarding careers which in turn can result in unhappiness in their chosen paths. These observations about ill-fitting career choices and jobs reinstate the need for standardised measures that directionally help students in making career and subject choices that are aligned with their interests, abilities, motivations and behaviours. It allows them to get more data points that support a directional outcome, making the decision informed and reliable.

The current study examined the tools available for this purpose and found that there is a lack of valid and reliable measures for identifying right subject and career through aptitude and interests testing in schools as well as predicting their success in those careers in the future.

### Way Forward

The origin of vocational guidance dates to 1908, when Parsons developed the 'talent matching' approach. With the core concept of 'matching', Parsons (1909) suggested that "occupational choice occurs when people have first achieved an accurate understanding of their individual traits (e.g. personal abilities, aptitudes, interests,

etc.); second, a knowledge of jobs and the labour market; and third, made a rational and objective judgement about the relationship between these two groups of facts." It is based on the assumption that a 'good fit' can be achieved by matching individual talents and the attributes required in particular jobs. When individuals are in jobs best suited to their abilities their performance and productivity is highest.

Keeping up with the changing trend of career guidance interventions becoming more central in primary and secondary schools around the world (Gysbers, 2000), CogitoHub has created four tools, each for a different grade from grades 8 to 11/12. These holistic assessments take into account one's Behaviours, Abilities, Motivations and Interests and give directive recommendations on subject and career choices. The tools bring experts in different Job Families and Subjects together to create scales that assess the behaviours, orientations, abilities and interests, and map them to these Job Families and Subjects.

CogitoHub Tool 1 (CHT1) suitable for students of Grade 8 to obtain a holistic understanding of behaviours, strengths and weaknesses, CogitoHub Tool 2 (CHT2) for Grade 9 gives an output on a student's alignment to subject streams (Science, Commerce, Arts & Humanities), CogitoHub Tool 3 (CHT3) gives information on a student's match with individual subjects and subject combinations he/ she can possibly choose in grade 11 and their Professional Orientation. For Grade 11 students CogitoHub Tool 4 (CHT4) gives an output on a student's match with each individual Job Family, the Job Roles that he/she can take up within the Job Families and the course/ career path he/she should take up to pursue that Job Family.



## Method

The is quantitative research assesses the validity of tools developed by CogitoHub which were designed to assess student

as Physics, Chemistry and Mathematics with elective options like Computer Science/Psychology etc. These combinations are important for students in

**Table 1: Outlining the input and output for each of the Cogito Hub Tools**

Tools	Behaviour	Ability	Motivation	Interest
CHT1	54 questions with two options. Student has to pick one of the two options.	3 sections (Logical, Mathematical, Verbal) each with 20 multiple choice questions and one right answer	18 statements have to be rated on a scale of 1-6 on importance (1- least important, 6- most important).	Not Assessed
CHT2	40 questions with two options. Student is required to pick one of the two options.	3 sections (Logical, Mathematical, Verbal) each with 20 multiple choice questions and one right answer	18 statements have to be rated on a scale of 1-6 on importance (1- least important, 6- most important).	12 Subject Group statements have to be rated on a scale of 0 to 3 (0- least important, 3- most important).
CHT3	45 questions with two options, from which the student is asked to choose one.	4 sections (Logical Mathematical, Verbal, Dimensional) each with 20 multiple choice questions and one right answer	Not Assessed	a. 45 Subject Statements (SS) to be rated on a scale of 0 (least) to 3 (most important) b. 54 Professional Orientation (PO) questions with two options from which students have to choose one
CHT4	2 sections, both of which have 72 Yes/ No questions about yourself (Section 1) and others (Section 2).	Not Assessed	Not Assessed	Job Family Statements which have 90 questions with two options from which students have to choose one.

inclination towards Job Families, Professional Orientations, Subject Groups and Subjects. A student is assessed for a total of 20 Job Families in CHT4 and 12 Professional Orientations in CHT3. Subject Groups (assessed in CHT 2) refer to the collection of subjects of Arts & Humanities, Science and Commerce which are the typical options that students of grade 10 have to choose from. Subject Combinations refer to combinations such

grade 11 and are assessed for in CHT3 through 15 Subject Statements. This paper aimed to establish the following:

Face validity for the scales on Behaviours and Motivations in CHT1

Face and content validity for Interests (Subject Group Statements) in CHT2

Face and content validity for Interests (Subject Statements), Professional Orientation Statements in CHT3



Face and content validity for Interests (Job Family Statements) in CHT4

### **Survey Design & Data Collection**

To design the survey for this study, Focused Group Discussions (FGD) were held with a panel of 3 psychologists, 8 researchers including Job Family experts, subject experts, statisticians and 2 students. The FGDs were conducted to arrive at operational definitions of the Job Family and Professional Orientation terms being used in the research (Appendix B). Furthermore, from a pool of 18 statements for each Job Family, Professional Orientation and Subject, 3 statements each were identified and shortlisted to create two online surveys on a platform called SurveyMonkey. One survey for the statements on Job Family and the Professional Orientations mapped to it, and the other for Subjects (Appendix A). The links to these surveys were shared with experts who were identified using a combination of Purposive and Convenience Sampling.

According to Dudovskiy (2016), purposive sampling and convenience sampling are non-probability sampling techniques in which the researcher relies on his or her own judgment and convenience when choosing members of the population to participate in the study. Based on the statements we identified experts in various professions and careers. The survey questions were objective and dichotomous, requiring the experts to give a Yes or No to each. This method was used to achieve the target of at least 5 experts per each Job Family, Subject and Professional Orientation. The survey was sent to 250 experts in Job Families and Professional Orientations, and 150 experts in Subjects, for their approval/agreement on the statements.

### **Participants**

For Job Family Statements (CHT4) and Professional Orientations (CHT3), the survey was sent to participants of an average age of 30 years, Graduates or Post Graduates with an average work experience of 7 years and belonging to SEC A1 or A2. A total of 234 responses were received out of which there were 127 males (54%) and 107 females (46%). For the survey on Subject Statements, a total of 142 responses were received out of which 34 were males (24%) and 108 were females (76%) respondents. They were Graduates or Postgraduates with an average work experience of 3 years and average age of 23 years, belonging to SEC A1 or A2.

### **Validity**

According to Steve Nguyen (2012), an instrument is said to be valid if it is measuring what it purports to measure. There are different types of validity: face, content, construct and criterion. Validity of an assessment is the extent to which it accurately measures what it is supposed to measure (Kelley, 1927). In the current study, we looked at two types of validity: Face validity and content validity.

According to Cohen & Swerdlik (2009), "Face validity relates more to what a test appears to measure to the person being tested than to what the test actually measures". On the other hand, "for an employment test to be content-valid, its content must be a representative sample of the job-related skills required for employment". Content validity is concerned with whether the test 'covered all bases'. According to a study by Larsson et al. (2015), validation is often achieved by a panel of experts who review the content of the proposed tests and determine its relevance in relation to the content domain. One such method called the Content Validity Index (CVI)



quantitatively estimates the content validity. The method is used for determining and quantifying the validity of different items in questionnaires. To control for high proportion of agreement due to random chance, modified Kappa statistics and calculation of the probability of chance were calculated (Larsson et al., 2015).

In this research, Behaviour and Motivation statements in CHT1 were validated by a team of 3 psychologists and 2 researchers. We obtained a Yes/No result from each of them on relevance, appropriateness, attractiveness, complexity and logical sequence of items. The items which did not have consensus were edited and reworded. Having high face validity is significant in this research since it is important for the students to feel confident about the test and be engaged through the entire test-taking experience.

Two types of CVI were calculated: Item-CVI (I-CVI) and Scale-CVI (S-CVI). The former is a validity index for the statements of each Job Family, Professional Orientation and Subject while the latter (S-CVI) is an average of I-CVIs giving an overall Content Validity Index for the tool. The raw data was exported from the online platform (SurveyMonkey), which was then used to calculate I-CVI for each Job Family and S-CVI for the Job Family Statements scale. Using this, the S-CVI of CHT4 was derived. Similarly, I-CVI for each Professional Orientation and S-CVI for the Professional Orientation Statements scale were calculated. Using this, the S-CVI of CHT3 was derived.

For establishing content validity, the CVI was calculated by dividing the number of experts that arrived at an acceptable relevance on each statement of the scale, by the total number of respondents of the survey for each Job Family, Subject and Professional Orientation. A modified

Kappa value which designates the agreement of relevance was calculated using the formula:  $k^* = (CVI - Pc) / (1 - Pc)$ . The probability of chance occurrence ( $Pc$ ) was computed using the formula for a binomial random variable, with one specific outcome:  $Pc = [N! / A! (N - A)!] \cdot 5^N$  where  $N$  = number of experts and  $A$  = Number agreeing on good relevance,  $!$  = a mathematical symbol for the product of all positive integers less than or equal to  $N$ , for example  $5!$  to mean  $5 \times 4 \times 3 \times 2 \times 1$ . Guidelines to evaluate the relevance of the tests were applied using an evaluation criterion for considering values for Kappa, as proposed by Cicchetti and Sparrow (1981):

Fair =  $k^*$  of 0.40 to 0.59;

Good =  $k^*$  of 0.60 to 0.74;

Excellent =  $k^*$  of 0.75 to 1.00

Polit (2007) states that after controlling items by calculating adjusted kappa, each item with I-CVI equal or higher than 0.78 would be considered excellent. Researchers should note that, as the number of experts in the panel increases, the probability of chance agreement diminishes and values of I-CVI and kappa converge.

## Results and Discussion

CogitoHub Tool 1 was assessed for face validity which was done for 72 statements for Behaviours (54) and Motivations (18) in CHT1. The statements were reviewed (Yes/No was recorded for each of the statements) by a team of 3 psychologists and 2 researchers. In the first stage, 63 statements had a unanimous high face validity and 9 had to be re-worded. These statements were also then modified till 100% consensus was achieved post the review.



Face validity was assessed for 70 statements (40 Behaviours scale, 18 Motivations scale questions and 12 Interests scale) in CHT2. Three psychologists and two researchers reviewed the content of the statements over 2 stages till a 100% agreement was attained. A total of 15 statements had to be reworded between stages 1 and 2 post which

Persuasive Professional Orientation is linked to Job Family of Business and Consulting as well as Marketing and Sales. Experts in both these fields would have marked a Yes/ No to the statements assessing for Persuasive. Hence, the number of responses are greater for Professional Orientation Statements. A

**Table 2: Content Validity scores for Subject Group Statements for CHT2**

Subject	Response Count	I-CVI	Kappa	Kappa Value
Science	21	0.85	0.85	Excellent
Commerce	26	0.89	0.89	Excellent
Arts & Humanities	64	0.6	0.58	Fair
Total Response Count	111			
S-CVI	0.78			

the statements and questions were sent to Subject Matter Experts for content validity. There was a total of 111 experts who responded to the CHT2 Subject Statements survey. Maximum number of responses were received for the Subject Group of Arts & Humanities and I-CVI for this was found to be 0.60. Highest I-CVI of 0.89 was recorded for Commerce which had a response count of 26. S-CVI was found to be 0.78 for the Subject Statements scale which is said to have excellent content validity (Polit, 2007). This is also supported by the kappa values of the items two out of three items have an excellent kappa value and the third item has fair kappa value (Cicchetti DV, Sparrow SA, 1981).

Here it is important to note that while the total number of respondents were 234 for CHT3 and CHT4, there is a difference between the number of responses received for these two. This occurred because every respondent could answer questions pertaining to only one Job Family but each Job Family was linked to multiple Professional Orientations. For eg:

few Orientations have a broad application and are required in multiple professional fields. These include Persuasive and Enterprising which have a high response count (75 and 63 respectively). Other orientations like Fiscal, have a domain specific application and hence have the lowest response count of 16. In the interest of clarity, all Professional Orientations and Job Families have been defined in Appendix B.

CogitoHub Tool 3 was assessed for face and content validity. There were 2 scales that were tested in this questionnaire: Subject Statements and Professional Orientation Statements. Face validity was assessed for 144 statements (45 Behaviours scale, 45 Subject Statements and 54 Professional Orientation Statements) which were reviewed by 3 psychologists and 2 researchers over 3 stages until 100% agreement was achieved. Through this process, 13 statements were reworded and the final set of statements was sent to Subject Matter Experts for content validity.



There was a total of 142 experts who took the CHT3 Subject Statement survey. Maximum number of responses were for Psychology, followed by Sociology, Mathematics, History, Economics and Chemistry. Only 4 participants responded for Geography. 13 out of 15 Subjects had I-CVI greater than 0.78, Physics was 0.68 and Geography was 0.56. Economics had the highest I-CVI of 0.97 from 11 respondents whereas Geography had the least I-CVI (0.68) with the lowest response count (4). As the number of experts for an item increase, the probability of chance agreement diminishes and values of I-CVI and kappa

Kappa are identical. The overall Scale-Content Validity Index for this survey was 0.85 which implies that the content validity is excellent. This is further supported by the kappa values, majority of which fall in the range of 0.74 to 1.00 which are excellent (Cicchetti DV, Sparrow SA, 1981). Tables 3 and 4 show the content validity scores for Subject Statements (Table 3) and Professional Orientations (Table 4). Ten out of twelve Professional Orientations had I-CVI

**Table 3: Content validity scores for CHT3 Subject Statements**

Subject	Response Count	I-CVI	Kappa	Kappa Value
Physics	5	0.73	0.68	Good
Chemistry	11	0.88	0.88	Excellent
Biology	5	0.93	0.92	Excellent
Mathematics	13	0.85	0.84	Excellent
Biotechnology	5	0.87	0.84	Excellent
Accountancy	6	0.89	0.88	Excellent
Business Studies	9	0.78	0.76	Excellent
Economics	11	0.97	0.97	Excellent
History	12	0.89	0.89	Excellent
Geography	4	0.67	0.56	Fair
Political Science	9	0.89	0.89	Excellent
Psychology	25	0.89	0.89	Excellent
Sociology	14	0.88	0.88	Excellent
Computer Science	7	0.81	0.8	Excellent
Multimedia & Graphic Design	6	0.78	0.75	Excellent
Total Response Count	142			
S-CVI	0.85			

converge (Polit, 2007). This is clearly outlined in case of Psychology and Sociology where the number of responses is comparatively high and the I-CVI and



greater than 0.78, which is considered excellent (Polit, 2007) and the remaining 2 had 0.69 (Technical) and 0.76 (Developmental), which are considered good. The Professional Orientation of Social had the highest I-CVI of 0.95 from 19 respondents and Technical had the lowest I-CVI of 0.68 from 32 respondents. Maximum numbers of respondents took the survey for the Professional Orientation of Persuasive- it had I-CVI of 0.83 from 75 respondents, whereas Structural had the least number of respondents (20) and I-CVI of 0.85. A total of 394 responses were collected from the survey and Professional Orientation Statements scale had S-CVI of 0.84, which lies in the range of excellent. Therefore, the scale of Professional Orientation Statements was found to be valid.

Cogit oHub Tool 4 was assessed for face and content validity. Similar to CHT2, face validity assessment was done for 234 statements (144 Behaviours scale and 90 Job Family Statements). Content of the statements was reviewed by 3 psychologists and 2 researchers over 2 stages until 100% agreement was achieved. Through this process, 17 statements were reworded and the final set of statements was sent to experts in specific Job Families for content validity. Out of 234 respondents, maximum responses were received for the Job Family of Marketing and Sales (21) while it was challenging to get experts from the Job Family of Infrastructure and Real Estate (5). 14 out of 20 Job Families had I-CVI greater than 0.78, which is considered excellent (Polit, 2007). These are further supported by the kappa values, majority of

**Table 4: Content validity scores for CHT3 Professional Orientation Statements**

Professional Orientation	Response Count	I-CVI	Kappa	Kappa Value
Mechanical	25	0.84	0.84	Excellent
Operational	24	0.79	0.79	Excellent
Technical	32	0.69	0.68	Good
Social	19	0.95	0.95	Excellent
Enterprising	63	0.87	0.87	Excellent
Persuasive	75	0.83	0.83	Excellent
Fiscal	16	0.93	0.93	Excellent
Procedural	39	0.92	0.92	Excellent
Structural	20	0.85	0.84	Excellent
Design	25	0.83	0.83	Excellent
Research	31	0.91	0.91	Excellent
Developmental	25	0.76	0.76	Excellent
Total Response Count	394			
S-CVI	0.85			



which lie in the range of 0.74 to 1.00, which is considered excellent (Cicchetti

CVI of 0.84, which lies in the range of excellent CVI.

**Table 5: Content validity scores for Job Family in CHT4**

Job Family	Response Count	I-CVI	Kappa	Kappa Value
Engineering & Technology	19	0.68	0.67	Good
Computer Applications	14	0.88	0.88	Excellent
Production & Manufacturing	6	0.89	0.88	Excellent
Management & Operations	13	0.74	0.72	Good
Infrastructure & Real Estate	5	0.6	0.42	Fair
Marketing & Sales	21	0.94	0.94	Excellent
Hospitality & Tourism	7	0.76	0.71	Good
Business & Consulting	19	0.75	0.75	Excellent
Media & Entertainment	16	0.81	0.81	Excellent
Community & Education	19	0.91	0.91	Excellent
Arts, Design & Literary	7	0.67	0.54	Fair
Planning & Architecture	7	1	1	Excellent
Software & Digital Design	11	0.85	0.84	Excellent
Pure Sciences & Research	14	0.95	0.95	Excellent
Social Sciences & Research	17	0.82	0.82	Excellent
Legal Services	8	0.96	0.96	Excellent
Financial Services	10	0.93	0.93	Excellent
Health & Medicine	9	0.89	0.89	Excellent
Defence & Civil Services	6	0.78	0.71	Good
Business Administration	6	0.89	0.88	Excellent
Total Response Count	234			

DV, Sparrow SA, 1981). The Job Family of Planning and Architecture had I-CVI of 1.0 which means all 7 respondents were in 100% agreement that the statements are relevant to the work in the area of Planning and Architecture. Maximum number of responses were received for the Job Family of Engineering & Technology (19) with I-CVI of 0.68, whereas Infrastructure & Real Estate received minimum number of responses of 5 with the lowest I-CVI of 0.60. The Job Family Statements scale and consequently, CHT4 are found to be valid since the scale had S-

The aim of this study was to establish validity for CogitoHub assessments CHT1, CHT2, CHT3 and CHT4. As can be inferred from the Results, CHT2 had S-CVI of 0.78, CHT3 had S-CVI of 0.85 and CHT4 had S-CVI of 0.84. Thus, the scales were found to be valid.

From the responses collected for the scale of Subject Group Statements (CHT2), it could be inferred that 2 out of 3 Subject Groups had excellent I-CVI whereas Arts & Humanities had the lowest I-CVI of 0.60. This can be attributed to the fact that Arts & Humanities is a wide area with



subjects ranging from Psychology to Geography as compared to fewer options in Commerce and Science. Due to this, more number of experts were easily available to respond to the survey. However, since Arts & Humanities covers a large range of subjects, achieving alignment of thought amongst the respondents was difficult. This contributed to the lower I-CVI of 0.60.

In case of Subject Statements in CHT3 maximum responses were collected for Psychology which can be attributed to purposive and convenience sampling since the researchers had professional association with experts in the field of Psychology. Sociology, Mathematics, History, Economics & Chemistry had responses ranging from 10 - 14 as they are usually the popular choices amongst students in higher education. On the contrary, Geography traditionally being an academically niche subject with limited application in the professional domain, received least number of responses. It has been observed in a study conducted by BBC Media (Richardson, 2011) that the decline of Geography in schools as a subject choice is due to the popular perception of it being "boring and irrelevant". The I-CVI for Geography was the lowest owing to limited information available for this subject, resulting in a divergence between the content for the statements and work in the area of Geography. Further, Economics had highest I-CVI which indicates near 100% alignment on relevance of the statements. There are wide applications of Economics which makes it one of the most sought-after subjects in recent times. Industry trends also emphasise Economics as a prerequisite to acquiring lucrative and respectable jobs in the corporate world as substantiated by an article in the Deccan Herald (De, 2016). Therefore, there was adequate field insight available to define

the statements and availability of knowledgeable experts to validate the same.

Professional Orientation is the predisposition towards the broad nature of work that is preferred by an individual. It can be inferred from the data that Professional Orientations which have a relatively less response count has higher I-CVI. Enterprising and Persuasive have a lower I-CVI value when compared to Social and Fiscal and a greater response count. This may be attributed to the fact that there is alignment of thought, a shared understanding of the area and reduced discrepancy if the pool of responses is smaller. This understanding of the domain is what was used to create the questions and hence the content validity scores are higher.

As can be seen, the highest value of I-CVI is for Social (0.95). Social Orientation is defined as the orientation to support and advance conditions of individuals and communities through social programs, agencies and organised movements. It is reflective of inclination towards the Job Family of Community and Education. The high validity could be due to the growing need for initiatives in the community and education sector. According to Johari (2014), Central Bureau of Investigation stated that India has two million non-profit organisations, one for every 600 people. Also, a significant rise in the number of new NGOs over the past decade was noted. In the Education industry, the 12<sup>th</sup> Five Year Plan (2012-2017) aims at an increase in literacy rate to 100%. Further, the Gross Enrolment Ratio for higher education in India is projected at 30% in 2020 as compared to 11% in 2006 (IBEF, 2012). This boon is attracting a set of people with similar motivations, aligned in their thoughts and expectations. The lowest I-CVI was noted for Technical Orientation which is linked with Job



Family of Engineering and Computer Application. Engineering is one of the traditional formal careers in the Education sector. According to psychologists, children live in an environment where most of the adult population are doctors or engineers and there is a lack of awareness about other professions. Apart from this, there is also social pressure to take up Engineering, much like in case of Medicine. As cited in Times of India (2003), education counsellor from a prominent Delhi school remarks, "most students tend to pursue medicine because they think it is a respectable profession." Thus, the reasons for pursuing a career may be externally driven. According to a study done by Kumari and Ahuja (2015), it was observed that students in humanities stream score higher on intrinsic motivation, whereas students studying business or any technical subject scored lower on the same. While the external factors influence the decision making, another study by Smitina in 2010, revealed that intrinsic factors contribute to job satisfaction. This research revealed the link between a student's vocational identity, motivation for their study choices, satisfaction with various aspects of study and thoughts of leaving their study. The results indicated that there was a high correlation between the high level of student's vocational identity, intrinsic motivation for study choices and that lead to a higher satisfaction with university, teachers, chosen study program and fewer barriers in continuing education. Since intrinsic factors are subjective and vary from one individual to another, a set of 3 questions perhaps did not cater to all the diverse backgrounds resulting in a low I-CVI of 0.69.

According to Gottfredson (2005), career aspirations of children are influenced more by the public (e.g., gender, social class) than private aspects of their self-concept

(e.g., skills, interests). A developmental model was proposed consisting of four stages of circumscription. The first is called "orientation to size and power" (ages 3–5) where the child perceives occupations as roles taken up by adults, second stage is called "orientation to sex-roles" (ages 6–8) in which the child evaluates occupations according to whether they are appropriate to one's sex and eliminates alternatives that are perceived to be gender inappropriate. The third stage is called "orientation to social valuation" (ages 9–13) as social class and status become salient to a child's developing self-concept. Accordingly, the emerging adolescent occupations that are too low or too high in prestige. The fourth stage is called "orientation to the internal, unique self" (ages 14 and above), in which internal and private aspects of the adolescent's self-concept, such as personality, interests, skills, and values, become prominent. It is also interesting to note here that the tools developed by CogitoHub are for students in the last stage, allowing them to know more about themselves using reliable and valid tools.

From the responses collected for content validity of CHT4 (Job Family Statements), we could infer that maximum responses were collected for Job Families of Marketing & Sales, Engineering & Technology and Business & Consulting. This pattern can be connected with the popular trend among the Indian population of pursuing careers in Engineering, Business or Marketing & Sales. As the data was collected through convenience sampling we could see that there were more responses on these popularly pursued Job Families than on less widely pursued Job Family such as Defence & Civil Services. Similar was the case with Health & Medicine, where, although we had reached out to 20 professionals in the field we received only 9 responses. This may be



attributed to the long work hours typical to the field and consequent lack of time to respond to the survey. The lowest number of responses were collected for the Job Family Infrastructure & Real Estate which could be due to experts leaving this industry. According to an article by Reuters (2015), the Indian construction sector has been facing a turbulence which has led to high attrition as well as gotten people to shift industries.

Further, we can infer from the data that the Job Family of Planning & Architecture had I-CVI of 1.00 which indicates that there was 100% agreement within the 7 experts of the Job Family. This means that all the statements pertaining to this Job Family measure what they purport to measure, and any outcome derived from these statements would be 100% accurate for people on whom the tool is administered. The courses for Planning and Architecture, on an average span over 5 years which is longer than the average duration of other courses. Due to this reason, people who pursue this course generally tend to be motivated and consequently know what to expect in the career. This may be the reason for greater alignment despite the relatively smaller group of experts who responded to the survey. Marketing & Sales, Community & Education, Planning & Architecture, Pure Sciences & Research, Legal Services and Financial Services had I-CVI greater than 0.90. This means that these Job Family Statements have a high content validity and hence measure what they are supposed to measure, as validated by the experts. The high content validity may also be attributed to the popularity of these areas in India, which is evident from the large fraction of population who are pursuing careers in these fields. Further these are fields which have been researched upon extensively, and hence there is wider awareness about these fields, which may have helped in creating valid

statements. On the other hand, while we examine I-CVI of other Job Families, we see that it is relatively low for upcoming Job Families such as Arts, Design & Literary, which has recently started becoming popular and hence is not as extensively researched upon or written about as the traditional Job Families.

### **Conclusion, Limitation and Further Implications**

The tools CHT1, CHT2, CHT3 and CHT4 were found to have high face validity. CHT2 had content validity of 0.78, CHT3 had content validity of 0.85 (for each of Professional Orientation Statements scale and Subject Statements scale) and CHT4 had content validity of 0.84 (Job Family Statements scale). Thus, the scales and consequently the four tools were found to be valid. This study is a step towards bringing in standardised measures to help students find the needs they are motivated by, interests they are passionate about, and make choices about their careers based on these. As per Super (1969, 1980, 1990) students from the age of 15 to 24 are in the exploration stage where they have to cope with the tasks of crystallisation (a cognitive process involving an understanding of one's interests, skills, values), specification (making tentative and specific career choices), and implementation (taking steps to actualise career choices). Allowing them to explore while providing them valid information will enable them to make informed decisions thereby increasing job satisfaction, and in turn solving the larger issue of talent mismatch.

### **Limitations**

- a. We used purposive and convenience sampling which are non-probability sampling methods where the samples were not randomised hence the generalisability of the study is restrictive.



- b. Gender was not taken into consideration in the study. There could be possible differences in the data if we had controlled gender in participant selection.
- c. Since each Subject, Professional Orientation and Subject had only 3 statements mapped to it, it is possible that they may not have covered all aspects of the field.
- d. There was a lack of existing research in the area of career assessments in the Indian setting because of which it was challenging to find sufficient review of literature.

### Further Implications

There is a need for more extensive research in this area and this study can be a stepping stone for further research on larger population in the field of career assessments. In the total findings, I-CVI of 10 out of 50 items were found to be below the cut-off of 0.78 (excellent). Based on this, the researchers will be looking at modifying the content of these 10 items to increase their I-CVIs.

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