The Talent Games

Predictivity of Gamified-Assessments used to assess candidates at a large bank based in Asia

A study looking at the construct validity of an immersive game-based solution used to support the bank's traditional and proven recruitment process.

Saqib Saddiq

MSc Occupational Psychology,
CPsychol, AFBPsS, CSci, EuroPsy

Hamza Humayun

Data Scientist

ABSTRACT

This white paper outlines a case study undertaken with a large bank based across Asia. As part of their current assessment process for hiring, a new landmark gamified and immersive assessment **(The Talent Games)** was used to assess candidates along with the bank's conventional assessment process.

The study identified that the **The Talent Games (TTG)** immersive gamified assessment could in essence remove some of the conventional assessment methods (video and face-to-face interviews) used by the bank, and still maintain a reliable and just as effective assessment process. Whilst the The Talent Games assessment not only had the potential to provide an engaging candidate experience along with saving costs and time for the organization, it would maintain a high standard of objectivity which would not be possible with assessments that rely on human intervention/interpretation (such as the bank's current process using interviews).

In sum, for this particular case study, it was found that:

1 Using demographic information alone to predict outcomes (i.e. job offers) was not effective, however using this information to reject candidates was highly accurate (**81%**).

2 Using The Talent Games assessment alone was both very good for correctly predicting those who should not progress (77% accuracy) and those who should (58% accuracy).

3 Finally, the use of both the demographics and game-based Assessment (TTG) combined, offered the best impact for identifying those who should be rejected (75%) and those who should be selected (62%) with an accuracy over 70%.

The study concluded with some considerations to the limitations of the study and the field of gamified research in general. With this in mind, the authors confidently conclude an excitement about this trend and particularly with the The Talent Games assessment which delivers everything one can expect from a traditional and psychometrically robust assessment process, yet does this in a light touch, engaging and objective way.

BACKGROUND

Attracting talent in the business world has become a cliché of a term, but nonetheless its criticality in selecting the 'right' talent is unwavering. Talented hires form a vital part of an organization's strategy; it is a key component that will significantly increase the likelihood for an ambitious vision to be achieved. Getting this right remains as ever key to an organization's relative success.

Both academic and business literature investigating these challenges is abundantly available, much of it investigating the recruitment processes which companies undergo to engage and identify new recruits, high-potentials and future executives. However there continues to remain a lack of consensus across Talent Acquisition functions around the 'best' methods amongst the myriad available, resulting in ever-changing discussions amongst both organizations and academics alike. In short, the journey to finding the right talent starts with attracting the finest candidates and then selecting the ones that 'fit' the best from the available pool. One thing is clear - attracting a greater range of candidates increases the likelihood of selecting greater numbers of talented individuals. A secondary challenge then presents itself which requires selecting the best talent in a manner that is both psychometrically robust, reliable and fair across all demographic groups; most importantly, the assessment methodology used for hiring should be predictive of subsequent job success-or in other words, demonstrate validity.

With the entry of the Millennial generation in the workplace and an empowered and connected world, organizations (recruitment teams) are faced with a wider remit to engage with talent across a greater geographical area whilst under increasing economic pressure. The necessity to attract and hire better talent under these challenging circumstances is only heightened with tighter budgets that organizations have to play with.

Each organization's demands are different too. From targeted leadership competencies and the plethora of 'corresponding' assessment methods, there exists a high degree of complexity when it comes to choosing the right set of assessment solutions to help with selection decisions. People Managers and HR Leaders often find themselves struggling to achieve a cohesive solution in which to embed these selection tools so that the process is simple for their users **(HR professionals)** whilst supporting objectivity by ease of consistency, and yet relevant, fair and reliable, inevitably (yet often inadvertently) ensuring the process remains legally defensible.

Deloitte's Human Capital Trends Annual Report 2017 indicated a need for leveraging technologically driven cognitive tools such as games for recruitment to create a digital experience and to broaden the sourcing channels while building a digital employment brand. Poor candidate experience using traditional methods does not only cost the organization a lost opportunity of recruiting talented individuals, but it has further proven to impact an organization's revenue. Virgin Media (a UK based telecommunica tions company) found that a poor candidate experience often meant losing a 'disappointed' candidate as customers when they decided to switch from the provider's service post-assessment. Thus, the need for an assessment process that offers a better experience has become clear, particularly when considering the impact any negative experience aired on social media can have for a company's brand.

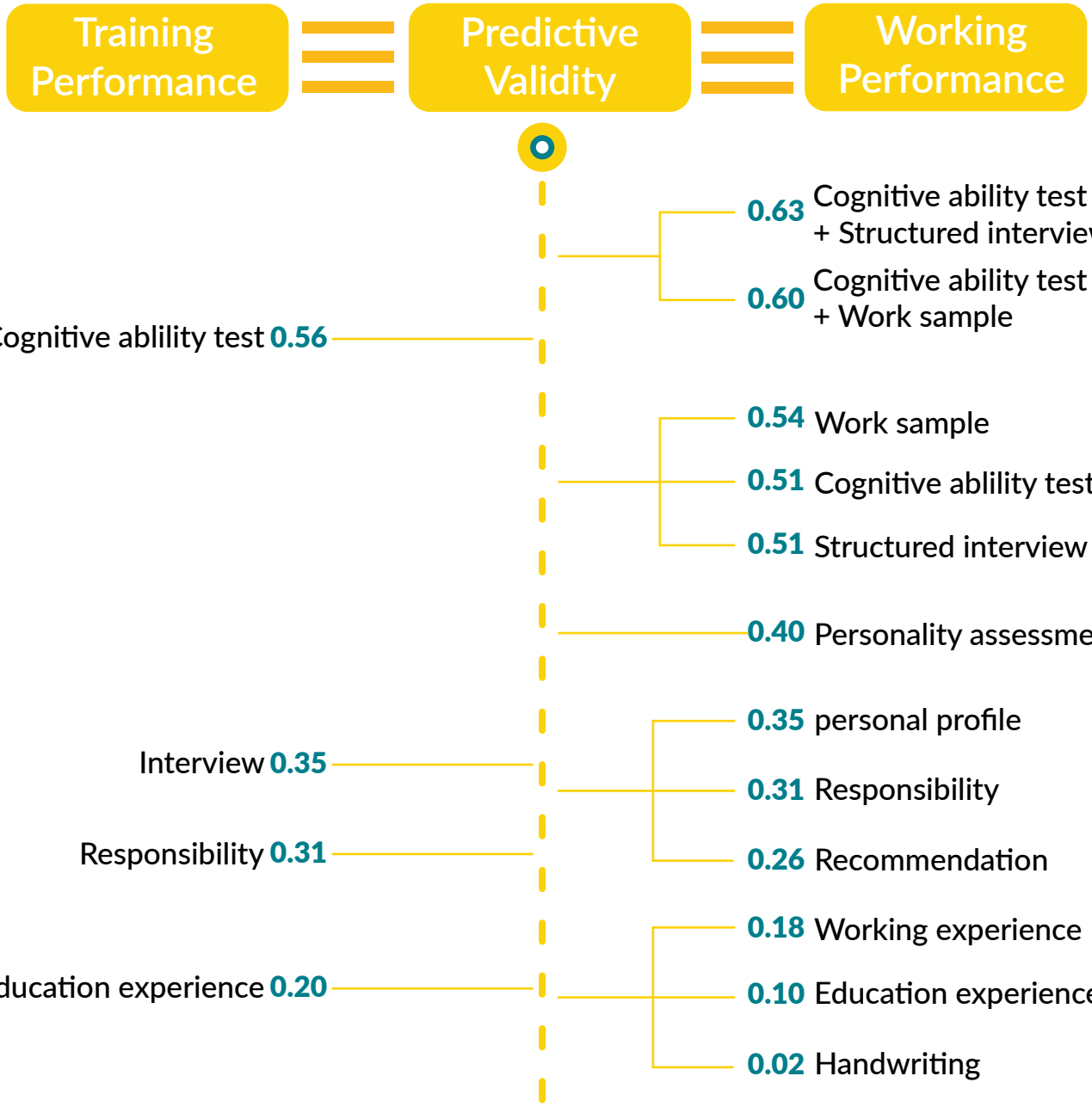
Research further supports the fact that new and innovative ways of assessing talent are appreciated by candidates who feel more engaged and report higher levels of candidate experience. There is significant value in a holistic gamified approach towards (prescreening) assessments, involving an immersive experience for candidates in a simulated environment using carefully designed tools that mimic the behaviors, skills and competencies that would be required for any particular job. Whilst there are limited studies in this arena, it is argued that gamified assessment methodology is able to seamlessly tap in to multiple sources of information that is relevant for the job, using ample variety to keep a candidate engaged whilst ensuring minimal adverse impact (due to discrimination). The assessments also save substantial HR time, and maintain objectivity throughout as opposed to gut driven, subjective decision-making that is still prevalent across organizations today.

Gamification in the context of recruitment is an engaging process, which makes use of different simulated elements at various stages of talent attraction and assessment, and utilizes game mechanics and elements which often involves the use of smart technology to generate meaningful data, thus subsequently enabling organizations (recruiters) to take more objective and unbiased talent decisions. It is therefore an important distinction to make that gamification itself is not a replacement of human elements of decision making, but a way to equip the decision makers with effective and unbiased data that enables them to make more reliable, informed and objective decisions. Very simply, the effectiveness of any gamified assessment can be measured by addressing two questions:

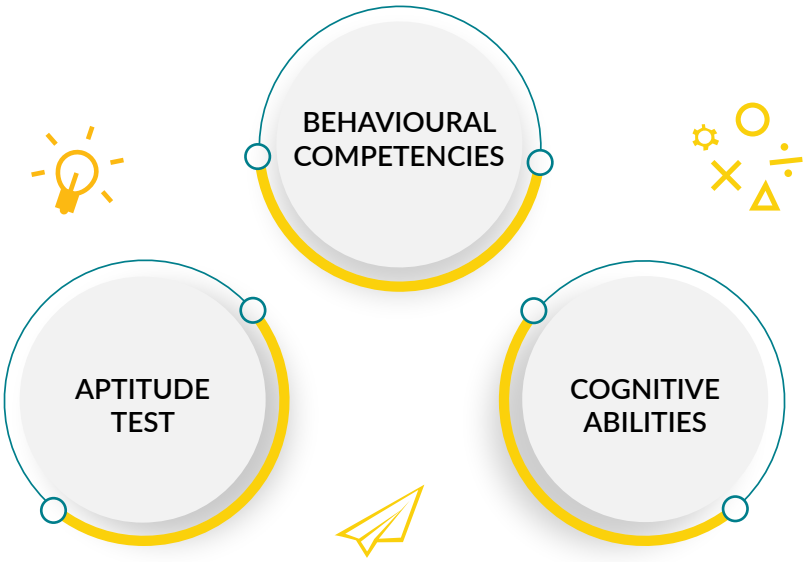
1. **How Engaging it is for the players (candidates)?**
2. **How accurately can it predict talent potential?**

APPLICATION OF ASSESSMENT METHODS

Predictive validity of different selection tools



It has been noted that cognitive ability tests have the highest predictive ability of a candidate's working performance (**Schmidt & Hunter, 1998, as seen in the figure above**). At '**The Talent Games**' **(TTG)**, we achieve this with a great degree of success using fully customized recruitment games or by leveraging our proprietary "C-Factor" model which is a combination of an immersive experience for the candidate in a



CURRENT STUDY

The **TTG** gamified and immersive assessment has been successfully implemented in dozens of global organizations and across numerous sectors. As would be the prudent course of action for any scientifically focused and data driven organization, it is the end-value that in terms of the value-add for the employer that needs to be considered by way of a predictive validity study.

This short paper focuses on the predictive power of our landmark gamified assessment (insert name) that was used as part of an assessment process at a large client, a multina tional bank based across Asia. It considers the impact of the immersive assessment on predicting talented individuals alongside proven (albeit lengthy and traditional) assessment methodology. In doing so, we aim to establish robust support for TTG's interactive assessment but also intend to further the area of research in this limited space, providing support for the significant gains to be had from utilizing gamified and immersive assessments by the HR population going forward.

METHODOLOGY

The study used a repeated measures design where candidates undertook the **TTG' (The Talent Games)** assessment as the initial pre-screening assessment, followed by the bank's conventional assessment process (consisting of a series of tools). The participants in this piece of research were candidates who had applied to the bank for employment in the capacity of Management Trainee. 10378 individuals applied from across 151 universities. There were 2821 females (27%) and 7555 males (73%). The education level of the candidates varied between Bachelors and PhD.

ASSESSMENT TOOLS

The Talent Games' signature assessment

This assessment was delivered as the initial stage of the assessment process. The game comprised of three major areas that made up the assessment as depicted in Table 1 below.

Area	Component Assessed	Output	Total Score
1.Cognitive Assessment	Numerical Reasoning, Inductive Reasoning and Critical Thinking	Overall Cognitive Score based on average across all Cognitive components	**The Total Score is calculated from all the scores from each component that is assessed.**
2. Situational Judgement	Up to 20 Competencies (See table below)	Overall Competency score based on average across all competencies chosen and assessed	
3. Mini Games	*Short games based on chosen attribute of interest	Each mini-game provides a score	

* Mini Games are innovative, immersive and time-limited short games that assess a particular attribute of interest, such as Memory.

The client selected their preferred mix of the three areas to compile their final Assessment game. Whilst best practice guidance was offered, selection of components to include in the assessment process was ultimately determined by the client.

COMPETENCIES FOR ASSESSMENTS

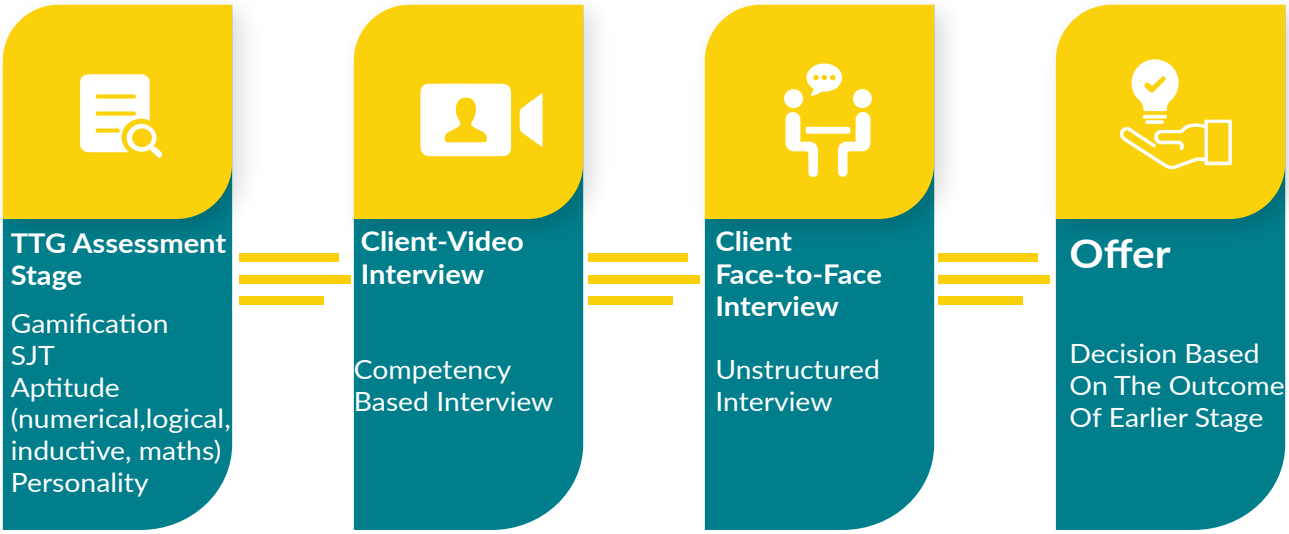
STRATEGIC THINKING	■ Has a broad perspective and understands the evolving market and industry trends ■ Can bring different streams of information together and translate that into a compelling view of the future ■ Has a clear understanding of how the business works, its strategy to succeed and expectations of the incumbents job
INNOVATION	■ Immerses himself in the problem to be solved ■ Thinks of solutions beyond any limitations of established methods and ideas ■ Actively tests out new ideas, and improves on viable ideas using data from each experiment
ENTREPRENEURSHIP	■ Displays a high level of excitement about his work ■ Is not afraid of taking appropriate risks to achieve the desired results ■ Maintains the self-discipline needed to achieve goals and deliver exceptional results
DRIVE FOR RESULTS	■ Has a bias towards action and getting things done ■ Takes personal responsibility for decisions, actions and outcomes with little oversight ■ Constantly drives self and others to deliver exceptional results
INFLUENCE	■ Understands and navigates the organization and can effectively manage politics ■ Has the ability to influence people without using authority ■ Is a source of positive energy for others
DELEGATION	■ Provides the resources and information required to accomplish goals ■ Empowers team members to make decisions and take action ■ Removes obstacles for team to achieve objectives
PERSEVERANCE	■ Does not give up in the face of initial failure or setbacks ■ Has the ability to learn from failure or setbacks to come up with alternate solutions to difficult problems ■ Can delay gratification by being patient in the face of failure or setbacks
IMAGINATION	■ Is curious about how the world works ■ Imagines novel possibilities to solve important problems ■ Effectively translates possibilities into practical ideas for implementation

PLANNING	■ Identifies and analyses information and translates this into actionable ideas ■ Effectively anticipates outcomes, generate and evaluates various possible contingency plans and choose the best alternative ■ Uses available information effectively to make timely decisions
EFFECTIVE COMMUNICATION	■ Can articulate and convey ideas and opinions in a persuasive and clear manner ■ Listens actively and effectively to develop a clear understanding ■ Can quickly find common ground and solve problems for the good of all
RECOGNITION	■ Creates a fun work environment ■ Generously offers support to team members in achieving goals and overcoming problems ■ Gives effective recognition and praise to people for their contributions and achievements
AGILITY	■ Has the ability to anticipate change and its implications ■ Has the flexibility to adapt and learn quickly in response to new circumstances ■ Is open to new ideas, ideas, champions change by influencing and inspiring others to embrace it
CHARACTER	■ Displays the highest level of personal Integrity, honesty and fairness at all times ■ Has the courage to make tough decisions and do the right thing ■ Is humble and treats all people with respect
VALUING DIVERSITY	■ Values the opinion of others ■ Appreciates ideas that are new, different from his own or the norm ■ Can work effectively with people from diverse backgrounds and appreciate differences
VALUING DIVERSITY	■ Invests in building strong relationships with stakeholders across the organization
CUSTOMER FOCUS	■ Is focused on and passionate about understanding and solving customer needs ■ Always acts with the customer in mind ■ Provides a standard of service that delights customers
SET DIRECTION	■ Sets clear performance standards and objectives that are aligned with organizational goals, both for team and individual team members ■ Inspires team members to maximize their performance and deliver exceptional results ■ Holds team members accountable for delivering on agreed goals

DEVELOP OTHERS	■ Accurately assesses and clearly communicates team members' strengths and development areas. ■ Creates impactful development opportunities for team members to build on their strengths and improve in development areas. ■ Personally invests time to mentor team members on their development
INVESTING IN SELF	■ Possesses a high level of self-awareness in terms of strengths, areas of development, motivations and goals ■ Has a growth mindset, the belief that intelligence and ability can be developed through effort and learning from mistakes ■ Invests time and effort in self-development
EXTERNAL ORIENTATION	■ Proactively builds, maintains and grows an external network ■ Uses external network to gain new ideas and support in solving problems ■ Proactively supports others in external network by connecting people and sharing knowledge

Client's current assessment process

The assessment process following the TTG assessment, comprised of a Structured Video Interview and an Unstructured face to face interview, before an offer was made. Thus combined, the overall candidate assessment journey is reflected across 4 stages as depicted below:



PROCESS

Candidates were invited to take the **TTG** assessment prior to the bank's conventional assessment process. Upon completion, those who passed Stage 1 were invited to progress through to the bank's assessment.

In total, 13,049 individuals applied of which 10,376 were invited on to take the **TTG** Assessment. The top 10% of scorers were then moved on to the bank's process of interviews. The stages of the recruitment funnel flowed as follows:

In collaboration with the bank's HR department, post-screening by the bank's internal processes, 10,378 of the applicants were invited to complete the **TTG** assessment within a four-week timeframe.

Once the **TTG** assessment was completed, the overall results (Total Score) for each candidate was used to identify the top 10% of performers who were then invited to complete the bank's Video Interview (700). 20% of those individuals (120) succeeded to the bank's face-to-face interview stage for an unstructured informal interview from which 48 were offered a position.

Assessment Stage		N (%)
Stage 1	The Talent Games' Assessment	10,378 (100%)
Stage 2	Client Video Interview	700 (6.75%)
Stage 3	Client Face-to-face Interview	120 (1.16%)
Stage 4	Offer	48 (0.46%)

RESULTS (DATA ANALYSIS)

There were two main objectives of the study. We provide a summary of each of the objectives and statistical approaches followed by the result outcomes.

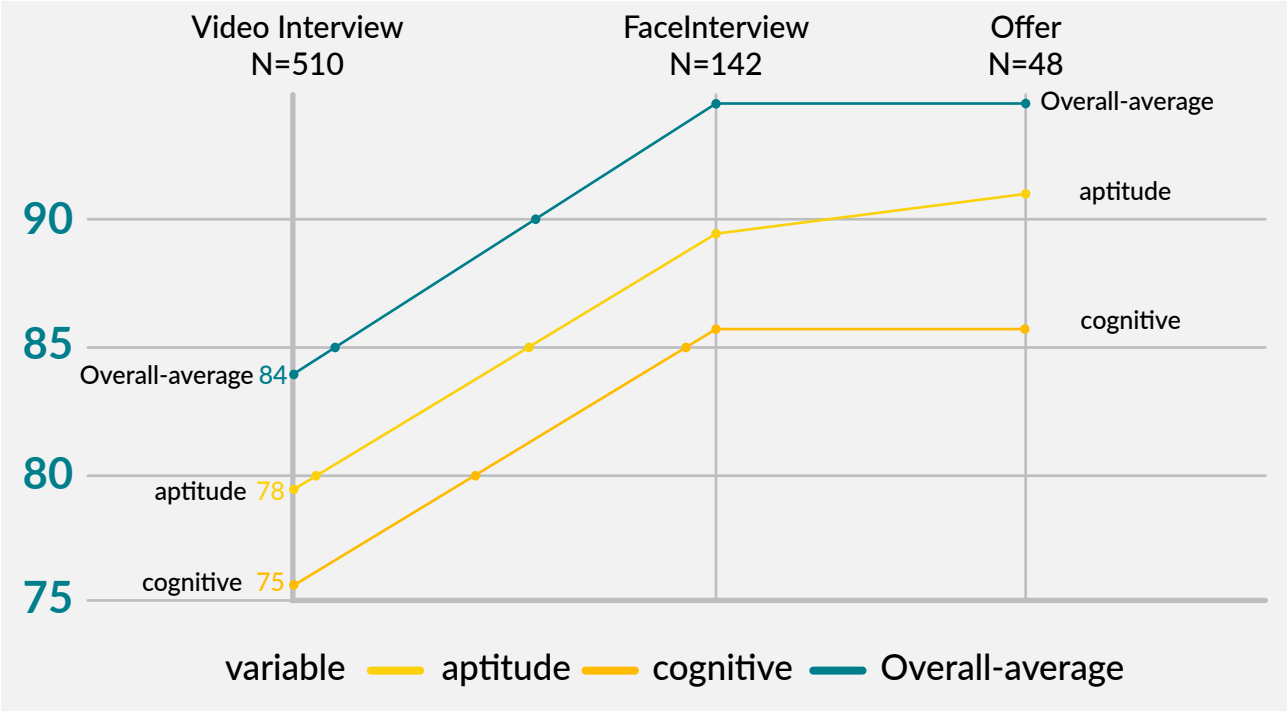
Primary objective

The primary objective of this study was to determine whether the assessment itself could be used as an instrument to predict outcomes further down the funnel for individuals or not. If this was found to be the case, it would then mean that the client could make the assessment process more engaging, but also more efficient/cost-effective simply by removing the labor extensive human elements of assessment (e.g. Interview). The ideal scenario would be that the TTG assessment accurately identified those to be hired that corresponded with those who were actually offered a job after undergoing the full conventional process. Further still, this would also mean a significant increase in objective decision making, given hiring decisions that were based on a tool with no human assessor intervention.

In order to explore this, a number of statistical analyses were undertaken. To determine whether the gamified assessment (TTG) provided any additional predictive power over (i) the demographic variables that were already readily available from the Bank and (ii) over the interviews (Video Interview at stage 2 and unstructured interview at stage 3), the predictive power of the assessment was tested at each of the remaining transitions, i.e. those from stages 2->3 and stages 3->4; therefore in lay terms, assessing whether the TTG assessment can predict those who will succeed to stage 3 and stage 4.

Figure 2 - Average percentile games scores (Overall,Apt<cog) of condidates who pass tha various stages of tha assessment (video interview and face interview)

Percentile(avg) by Metrics for 700 Shortlisted



PRELIMINARY FINDINGS

From the graphical representation alone, it is apparent that those candidates who passed the video interview stage (2) were those individuals who had performed significantly high across all 3 elements of the **TTG** (gamified) assessment with average percentile scores >86.

Arguably, the bank could have excluded the video interview stage and chosen candidates who had performed say higher than e.g. 80th percentile on a game element. This would have resulted in a better candidate experience, more efficiency and cost savings for the bank.

Note: in setting a 'pass-mark' criteria, further analysis would determine the minimum percentile values of the ranges for each game element. For example, if the cognitive range of scores for individuals who passed the video interview is 75-91 (mean = 86), then a candidate would have been expected to have at least achieved the minimum 75th percentile for this element, and also satisfied the minimum scores for the remaining game elements before being moved on to any next stage.
Finally, using this reasoning, it is then clear that the use of the Face-to-face interview by the bank did not see any change/or add any value in identifying the better candidates than the **TTG** game percentile scores; no change in the average group percentile scores (for the 3 game elements) was observed for the candidates who succeeded the face interview and were offered a job (stages 3 > 4).

PREDICTIVE ACCURACY

Further analysis was undertaken to explore the predictive power and accuracy of the gamified assessment. Separate predictive models (using boosted regression trees) were developed to predict the outcomes at each of these two transitions. As a result, 3 Models were considered:

Model 1 - Demographic variables only

Model 1 used demographic variables that are typical and are commonly known to a company during recruitment. These included:

1. CGPA score (Cumulative Grade Point Average – used to indicate a student's overall academic performance on a scale of 0-4.0),
2. University Attended and
3. Program of Study.

The analysis assessed whether the demographics were predictive of which candidates made it to stage 3 (face-to-face interview) and stage 4 (offer).

Model 2- Assessment variables only

Model 2 used competency and cognitive scores from the TTG assessment. This includes the cognitive score, overall score and each of the other competency scores.

The analysis assessed whether the Assessment variables from the stage 1 TTG (game) assessment were predictive of which candidates made it to stage 3 (face-to-face interview) and stage 4 (offer).

Model 3 - Assessment + Demographic variables

Model 3 used both assessment and demographic variables together. The purpose of this model was to test if demographic variables provided any additional value in the presence of the (stage 1) TTG game assessment variables.

Statistical modelling

The input data for the model was the data for all the candidates at the start of each stage and the output/target variable was the outcome of that stage for each candidate. The outcome variable was binary, simply indicating if a candidate was successful in transitioning to the next stage or not. For example, the model to predict transitions from video interview (stage 2) to face interview (stage 3) would take as input data for all 700 candidates who underwent the video interview (see figure 2). The outcome variable in this instance was a binary variable with a '1' indicating a candidate's successful progression onto the face interview stage, and a '0' for candidates who were not successful.

Metrics for these three models when taken together helped to form a complete picture of the differential value add of the TTG (stage 1) assessment (along with the readily available demographics).

Modelling Technique

The modelling technique used was gradient boosted regression with 100 bootstrapped runs. At each Bootstrapping technique was employed to ensure that performance metrics of the model would be as close to the 'true' underlying metrics as possible in order to increase robustness and reliability. The following metrics were used for the evaluation:

1. Predictive accuracy
2. True positive rate
3. True negative rate
4. Area under curve (AUC)

At any stage only a small percentage of candidates proceeded to the next stage. Hence, predictive accuracy on its own was not a good metric as even the random rejection of candidates with a probability close/equal to the empirical rejection percentage would produce an accuracy rate which appears to be (falsely) high. The most robust testing of the model in this case would be the True Positive rates, the True Negative rates and the AUC. True Negative and Positive rates can be related directly to the business objectives of the assessment.

A high true positive rate - means that if the model predicts that a certain candidate will move to the next stage then it will be highly likely that this is actually what happened. This means that the assessment is able to successfully identify those candidates that should move ahead.

A high true negative rate - In the same light, those who did not move ahead, are correctly identified by the model as not moving ahead. A high true negative rate implies that the assessment can be used as a good 'filtering' mechanism, to reduce the number ofcandidates that should be examined more closely (e.g. an in-person interview etc.) at each stage in the process.

Area under the curve (AUC)- A measure of predictive accuracy of the model. A model with an AUC less than 0.5 does not add value. Therefore, if the model has a predictive accuracy greater than 0.5, it is of interest to us.

Outcomes

The predictive results were calculated for each model and depicted in table 2 below:

Model Results	Accuracy	True Negative	True Positive	AUC
Demographic Only	66%	81%	27%	58%
Assessment Only	72%	77%	58%	73%
Demographics Assessment	71%	75%	62%	75%

For Model 1, which included the Demographic variables only, the true negative rate was 81% and the true positive rate was 27%. This suggested that for the transition between the video interview stage (2) and face interview stage (3), the model had greater predictive power in 'sifting out' candidates who were not a good fit, rather than selecting those who were.

For Model 2, where only the Assessment variables were evaluated, there was a higher true positive rate, suggesting that it was easier to select candidates who progressed ahead based solely on their test score, compared to Model 1 which focused solely on their demographics (such as University, Major, GPA).

Model 3, which included both Demographic and Assessment variables had the highest true positive rate of 62%. This meant that the TTG assessment was able to successfully identify those candidates that should move ahead with a high degree of accuracy. It was interesting to note that the AUC for Model 2 and that for Model 3 did not have a significant difference, signifying that Demographic variables did not provide any additional predictive power in the presence of TTG Assessment Variables.

CANDIDATE EXPERIENCE

Candidate experience is of immense importance as a poor candidate experience can have far reaching effects that the employer may not even anticipate. It creates a negative word of mouth about the organization which can take a toll on the organizational reputation. A survey conducted by CareerArc suggested that 72% of job seekers who had a poor candidate experience tend to share it on social media, friends or on employer-review sites like Glassdoor. Furthermore, it can also affect the future talent pool as was found in the Candidate Experience Awards survey; 27% of candidates who had a poor experience would openly discourage others from applying for that organization. And in worst cases, a negative candidate experience during the hiring process can damage the brand perception such that the candidate might give up on the consumption of or any association with this brand. Another Candidate Experience Research Report highlighted that 41% of applicants with a poor candidate experience would build no relationship with the employer or their products or services.

The data collected from 6555 candidates who participated in TTG Assessment Candidate Survey in 2018 indicated that they overall enjoyed the gameplay experience.

Gameplay Experience Factors

75% of the survey respondents agreed that TTG Assessment has been a pleasant experience compared to other MT Programs they had applied for - specifically, in terms of ease of understanding, being realistic, relevant, challenging, engaging and attractive. Most of the candidates believed that TTG Assessment offered them a fair and transparent recruitment process. They also appreciated the exposure they were offered to real-life challenging work situations presented in a gamified manner which made the recruitment process less stressful and more enjoyable. They found it to be more credible, more professional and particularly enjoyed the interactivity. It is interesting to note that TTG Assessment played a crucial role in changing the employer brand. 62% of the survey respondents claimed that it did so by portraying the organization as better suited for younger generations, that fosters creativity, values innovation, leverages on technology and seems like a fun place to work.

DISCUSSION

The results from this study have provided strong support for the predictive value of gamified assessments in the field of Talent Acquisition.

Research in the field of immersive assessments is at a very early stage, and there is clearly a long way to go. Construct validations for immersive assessments carry challenges simply because it is very rare to validate an assessment against a similar one (game) that is established well in industry. Unlike conventional assessments where a personality measure may be validated against one that is well established (e.g. Big-5), or a numerical test is validated against one that carries the same psychometric properties and consistency in format, Gamified assessments vary significantly in their appearance, data that they capture and user experience. This introduces yet another substantial difficulty when it comes to validating these tools against others that fall under the same label.

As such, at this stage, it appears the best that any validation study of a game-based assessment can hope for is to compare its effectiveness against current/conventional methods of assessment to, at the very least, justify its use beyond the value they bring to the increased objectivity, reduced bias and engaging candidate experience which has been shown to carry potentially damaging consequences for employer organizations.

The current study aimed to explore the predictive power of an immersive game-based solution in hiring candidates in line with what a bank's conventional process would. In sum, this was found to be the case. The TTG assessment alone, along with the demographical data (which is virtually always readily available during candidate applications) demonstrated that it could predict those individuals who would (i) succeed (in this case), the bank's Video Interview making it to the face-to-face interview stage; and (ii) succeed the f2f interview stage in order to be offered a job.

Whilst these findings provide excitement for the authors and hopefully for game-based assessment publishers/researchers, the study is limited to a bank, albeit large) based in Asia. Further scope for research was considered and it was clear that it would be ideal to undertake predictive validity studies based on organization' KPIs such as performance, potential, engagement, all outcomes that are determined after a length of time after a candidate's employment. Nevertheless, this study lends one exciting and significant step in the journey to highlighting the tremendous value that gamified assessments have to offer in the field of recruitment going forward.

The Talent Games

ABOUT THE TALENT GAMES

The Talent Games is a Singapore-based HR Tech company that provides gamified recruitment solutions. We have more than 25 clients across Asia and Africa and have assessed **200000+** candidates. Using our AI-driven gamified assessments, companies attract, engage and assess the best millennial talent. We use gamification principles, artificial intelligence, neuroscience-based games and other exponential technologies to empower organizations to uncover the best talent. Our gamified recruitment solutions work as a pre-screening tool for employers and candidates find them engaging and more fun than traditional assessments. We offer customized games to companies so that they can build their employer brand that millennials love. We also have a standard assessment platform in the name of C-Factor (a syndicated platform), where multiple companies can assess candidates in terms of their cognitive abilities, personality, aptitude, and behavior.

CONTACT US

PAKISTAN

- +92 322 4244487
- aashir@thatalentgames.com
- M-1,12-C 10th Zamzama St.
  D.H.A Phase 5, Karachi

SINGAPORE

- +65 81320107
- sales@thetalentgames.com
- 49A Temple Street, Singapore 058549.