

Gamification for future workforce studies: cyber- security and efficiency

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Author:
Aisvarya Adeseye

Supervisors:
Prof. Jouni Isoaho
Dr. Tahir Mohammad

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In this era, organisations' workforce dynamics are ever-changing, triggering the need to conduct frequent workforce studies. Performing workforce studies allows the management to measure employee engagement, well-being, knowledge, diversity and inclusion, discrimination, racism, employee retention and satisfaction. However, organisations face several challenges by utilising traditional workforce studies, such as low response rates, not being aware of the appropriate study timeframe, and requiring significant resource allocation. Gamification is the application of game elements to motivate individuals to achieve specific goals.

Currently, the application of gamification is increasing across various industries, such as education, healthcare, and recruitment. Therefore, this research study evaluates the efficiency of gamification strategies for workforce studies within an organisation. Additionally, it explores the cyber security and privacy challenges inherent in implementing gamified platforms within an organisation. This study employs an interview approach to gather qualitative data systematically. This study encompasses a participant pool that comprises 82 professionals representing 5 major sectors such as non-governmental organisations (NGOs), corporate entities, academic institutions, government bodies and healthcare providers.

The qualitative data were analysed using thematic analysis, and the comprehensive examination identified 21 distinct themes. The participants unanimously stated that the gamified platform for workforce studies will not replace the traditional approaches; rather, it will be supplementary and supportive of the existing approaches. Moreover, participants also mentioned that the employees should be allowed to engage with the gamified platform weekly. This regular participation could ensure continuous monitoring that could indicate to the management when the optimal time to conduct the traditional workforce studies is. Moreover, participants pointed out that there is a need for a balance between the security measures and efficiency of the gamified platform to ensure success implementation.

This research also provides four recommendation stages (designing and implementation, roll-out, maintenance, and success rate determinant matrix) for any organisation that plans to implement a gamified platform for future workforce studies.

Keywords: Gamification, Workforce studies, Cyber-security, Privacy, Efficiency, Gamified Platform

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1 Chapter 1: Introduction

1.1 Background Study

As organisations navigate the complexities of a rapidly evolving business landscape, workforce studies emerged as an essential tool for strategic workforce planning and talent management. Workforce studies, also known as work surveys, are widely used in organisations to improve their human capital by understanding their employees' work, skill sets and behaviour and how they affect the employee at every stage in the organisation (Morrel-Samuels, 2002; Castelino & Shinde, 2023). Also, Chandrasekar (2011) stated that workforce studies have been utilised in improving organisational performance. Consequently, organisations perform frequent workforce-related studies to acquire talents and retain them.

Some of the most widely used workforce study tools include the GTE survey and 360-employee feedback tools (Morrel-Samuels, 2002; Rafiq et al., 2023). Several companies have adopted employee surveys as they could assist the organisation in improving employee motivation, job performance, and improvement of HR organisations. According to Morrel-Samuels (2002), good surveys are prepared in an unbiased format and provide adequate solutions to address potential problems that may affect the organisation's performance in the future. However, Morrel-Samuels (2002) also identified several limitations concerning the approaches used in performing workforce studies, including the inability to accommodate all the relevant information and creating new problems instead of solving those problems.

Garrad & Hyland (2020) demonstrated that workforce studies are significant because they help organisations understand the employees' well-being and take the required steps to improve them. Organisations that consider their employees' well-being tend to have employees who are motivated, engaged, productive and always willing to work (Smith & Holden, 2016). According to Castelino & Shinde (2023), workforce studies have been relevant in ensuring that critical areas pertinent to the growth and development of many organisations concerning organisational performances are properly given due consideration. These areas include diversity and inclusion, leadership, well-being, and knowledge management. Vital consideration of these areas can result in the organisation's optimum performance because they can help achieve a good workplace environment for the management, employees, and clients (O'Donovan, 2018).

Castelino Shinde (2023) investigated diversity in education and inclusion in organisations to understand their roles in improving organisational performance and workplace culture. The study identified that diversity and inclusion increase the sense of belonging among organisational staff and their interconnectedness with one another, which translates to a higher level of productivity and innovation. The leadership style adopted by an organisation could be evaluated using workforce studies because they can help understand how effective they are in achieving the organisation's goals (Akpapere et al., 2019). Knowledge management is another crucial aspect that optimises organisational performance, which is measurable using workforce studies. Knowledge management is relevant because it helps determine the functioning and operational aspects of the organisations (Akeke et al., 2023).

Modern digital technologies such as artificial intelligence, the Internet of Things, cloud computing, and gamification have increased efficiency, productivity, and organisational performance (Akter et al., 2023). These digital technologies help the human resource (HR) sector collect, analyse, and produce relevant reports to optimise the development and growth of several organisations (Akter et al., 2023). However, these digital technologies may negatively impact security and increase privacy concerns (Melaku, 2023). Therefore, organisations need to ensure that these digital technologies are effective and that the cyber security and privacy risks associated with their usage are also addressed.

Although workforce studies have been reported to be primarily beneficial, the approaches utilised in conducting them were developed during the early 20s, which means they might require some enhancement to adapt to today's technologies (Garrad & Hyland, 2020). The introduction of digital technology to organisations has been reported to influence workforce management (Akter et al., 2023). They are beneficial to meeting the current demand in education, health, commerce, information and technology, as well as other industries (Shoubashy et al., 2020; Navarro-Espinosa et al., 2022).

One such digital technology that is gaining wide acceptance in various industries is gamification. Gamification refers to applying gaming elements to online businesses to stimulate the user experience, thereby increasing participation ability. It is beneficial in overcoming boredom in some job activities. Gamification has been reported to be best applied in online contexts other than real-life situations (Shoubashy et al., 2020). Shoubashy et al. (2020) defined gamification as introducing game design elements in a non-game environment or context, voluntary and enjoyable activities, and service provision that complements the

user's value creation. Narayanan & Kumaravel (2024) explained gamification as a process that increases users' motivation and allows for achieving expected goals with gaming elements.

Many organisations utilise online strategies such as online questionnaires to improve employee experience in workforce studies. Similarly, many fields have used the concept of gamification in many different areas except workforce studies, and it has proven to be beneficial in the areas they have been adopted; for example, Navarro-Espinosa et al. (2022) found that gamification tools help improve teaching and learning in the education sectors. Therefore, this research seeks to explore the effectiveness of applying gamification strategy to improve workforce studies; the cyber security and privacy concerns they may pose are also investigated.

1.2 Problem Statement

While most organisations perform workforce studies, the question remains on how effective the current workforce studies are and how frequently the workforce studies should be conducted. Literature has identified several drawbacks to the approaches utilised in workforce studies, including bias in the questions and answers, lack of trust from the participants, low participation rate, and limitation in expressing it with language, among others. Kirovska et al. (2020) recommended using gamification in human resource (HR) management to increase motivation and enhance the productivity of employees.

Also, it has been reported that gamification elements are applied in employee recruitment and employee training, which are great resources to improve organisational performance (Obaid et al., 2020). For example, Xiao et al. (2023) presented a feasibility study with recommendations to enhance the teaching of cyber security courses in China using a gamified approach. Similarly, O'Hare & Shepherd (2020) also discussed how gamification could help enrich cyber security training provided to employees as it could give a role-play scenario to the trainees to see how they will strategise defensive mechanics as well as how they will respond to attacks, resulting in quicker and more effective knowledge acquisition. In the educational sector, studies have shown that gamification has been attributed to improving the learning ability of students and the teaching ability of teachers (Rafiq et al., 2023).

However, the introduction of gamification in workforce studies presents potential cyber-security and privacy risks and challenges that need to be identified and analysed. Batzos et al. (2023) and Xiao et al. (2023) showed that gamification elements are associated with cyber-security risk. Also, Mavroeidi et al. (2019) reported that gamified elements may violate

privacy. The over-dependence of people on the use of electronic technologies for economic, cultural, and social activities makes them increasingly vulnerable to cyber-attacks (Xiao et al., 2023). Cyber-attacks typically rely on malware and phishing to collect sensitive and valuable information from organisations, and this is possible mainly because of human element failure (Li and Liu, 2021; Batzos et al., 2023; Rohan et al., 2023).

Like many other technologically driven platforms, gamified platforms for workforce studies will primarily use the internet to encourage and engage users to participate in a particular event or activity. They will require connecting devices such as computers and mobile devices, posing cybersecurity risks and privacy concerns (Li & Liu, 2021; Batzos et al., 2023). However, studies have provided some strategies to improve the use of gamification in activities so that cyber-related threats and privacy risks are mitigated (Mavroeidi et al., 2019; Hart et al., 2020; Xiao et al., 2023). Hart et al. (2020) showed that reducing cyber-security issues and privacy risks may require many industries and organisations to invest in providing professional training courses for their employees to increase awareness of cyber threats and protective strategies, which has financial implications as well (Akeke et al., 2023; Akter et al., 2023).

Hyrynsalmi et al. (2018) encouraged developers to consider ethical issues while developing gamification systems. Mavroeidi et al. (2019) showed that privacy issues could be considered in the development and design of gamification applications, as this will help ensure that privacy concerns are adequately cared for while using gamification applications. Hence, the study determined the kinds of gamification elements that might be beneficial to protect the privacy rights of individuals (Mavroeidi et al., 2019). Existing studies have discussed the potential benefits, drawbacks, and mitigating strategies of gamification in several areas, such as human resource recruitment, education, training, and others. However, no specific studies introduce and discuss applying the gamification concept to workforce studies.

Therefore, this study will focus on performing in-depth research on the efficiency, potential benefits, drawbacks, and challenges of introducing the gamification concept in workforce studies. Moreover, this study will focus on cyber security risk and privacy issues because the literature has proven that they are vital concerns that must be evaluated before gamification can be effectively introduced for workforce studies. As modern organisations seek to optimise their performance and productivity while ensuring a diverse and inclusive environment, effective leadership, employee well-being, and knowledge management, the researcher of this study believes that the gamification approach could be a game changer to the current

approaches for workforce studies. Hence, the author seeks to investigate the feasibility of gamification replacing or augmenting various organisations' current workforce studies techniques.

1.3 Aim and Objectives

This research aims to study the reliability and validity of data from the gamified platform for future workforce studies, especially in the context of diversity and inclusion, leadership, well-being and knowledge management. Also, it focuses on gathering the employees' and management's perspectives on the expected challenges and concerns associated with its introduction within an organisation. This research finally provides insights and recommendations for effective design and implementation for future gamified platforms for workforce studies. The objectives of this study are provided below:

- **Objective 1:** To study the reliability and validity of data collected through a gamification platform for workforce studies. This objective aims to study what type of data can be gathered from the platform with its potential biases, limitations, and measurement errors that may arise from using gamified platforms for future workforce studies to ensure its accuracy and credibility.
- **Objective 2:** To investigate the challenges and barriers to successfully designing, implementing and rolling out a gamification platform for future workforce studies. This objective aims to identify factors that could directly and indirectly influence the platform's efficiency.
- **Objective 3:** To study the employee and organisational perspective on the potential cyber-security and privacy concerns associated with the introduction of gamification strategies and platforms for future workforce studies. This objective aims to extract possible cyber security and privacy concerns and their implications on the efficiency of gamified platforms for future workforce studies.

1.4 Research Questions

The key research question of this study is “*What are the cyber-security and privacy concerns associated with the introduction of a gamified platform for future workforce studies, particularly in the context of diversity and inclusion, leadership, well-being, and knowledge*”

management, and how can these concerns be identified, analysed, and mitigated to ensure the efficiency of the gamified platform?”.

The sub-research questions of this study mapped against its objectives can be seen in the table below.

Table 1: The sub-research questions

Objectives	Sub-research questions
<p>Objective 1. To study the reliability and validity of data collected through gamification platforms for workforce studies.</p>	<ul style="list-style-type: none"> • To what extent is the data collected from gamified platforms for future workforce studies reliable, and how could potential biases within the platform impact the accuracy of the gathered data? • To what extent is the data collected from a gamified platform for future workforce studies valid? And what measures should be considered to identify validity concerns? • To what extent do the reliability and validity of the data affect the efficiency of using a gamified platform for future workforce studies?
<p>Objective 2. To investigate the challenges and barriers to successfully designing, implementing and rolling out a gamification platform for future workforce studies.</p>	<ul style="list-style-type: none"> • What general challenges and barriers will the introduction of a gamified platform for future workforce studies bring? • What mitigation approaches can the organisation adopt to implement an efficient gamified platform for future workforce studies successfully?
<p>Objective 3. To study the employee and organisational perspective on the potential cyber-security and privacy concerns associated with the introduction of gamification strategies and platforms for future workforce studies.</p>	<ul style="list-style-type: none"> • What are the potential cyber-security and privacy concerns organisations should focus on mitigating before implementing an efficient gamified platform for future workforce studies? • What data should be gathered, stored, and utilised if the gamification approach is used for future workforce studies without triggering privacy concerns?

Objectives	Sub-research questions
	<ul style="list-style-type: none"> • What legal and ethical considerations should organisations consider when designing gamified platforms for future workforce studies?

1.5 Motivations

The current topic of interest is selected because the researcher has almost 10 years of experience performing workforce studies for several organisations. The researcher has personally faced several challenges in utilising current methods to perform these studies. The unwillingness of employees to participate in workforce studies is one of the significant issues. The researchers Burkitt & Playford (2017) and Twose et al. (2023) believe that some of the reasons for the non-participation include employees not trusting that their voices are being heard in the organisation, the fear of being at odds with the management as well as the inability to find adequate words to express themselves. Hence, the researcher wants to explore how gamification strategies can help improve or solve some or all of these issues.

1.6 Report Structure

The rest of the chapter consists of 6 distinct chapters, and a brief discussion about the chapters is provided below.

Chapters 2, 3 and 4 meticulously navigate the existing knowledge for the basic concepts of this research study. Chapter 2 focuses on the basic concepts of workforce studies and the present approaches introduced in the literatures to conduct them. Chapter 3 introduces the general idea of gamification and its current applications in different sectors discussed in the literature. Chapter 4 focuses on cyber-security and privacy concerns in general and the legal and ethical perspectives discussed in the literatures.

Transitioning from the literature review, chapter 5 articulates a detailed description of the approach adapted to perform this study, including justification for the methodology utilised. Additionally, this chapter also provides detailed information about the demographics of the participants of this study.

Chapter 6 focuses on the results and discussion of the findings gathered from interviews conducted for this study. The findings are grouped based on the objectives of this study to provide clear clarity for the reader.

Lastly, chapter 7 summarises the findings for the research questions of the studies and the recommendations derived from the interviews conducted for this study.

2 Chapter 2: Workforce Studies

Workforce studies, also known as work surveys, are relevant to improving organisational performances, as they help obtain feedback that might enhance the services or products of a particular organisation (Aburayya et al., 2020; Zhenjing et al., 2022). This chapter describes workforce studies and their components, such as diversity and inclusion, leadership, well-being, and knowledge management. It also discusses the role or importance of workforces and compares existing workforce studies approaches.

2.1 Definition and evolution of workforce studies

Workforce studies may have existed for a long time; however, the meaning may not have been explicitly stated in the research literature. Workforce studies are used to collect data relevant to improving organisational performance and have been referred to as employer workforce studies (Short et al., 2007). According to Short et al. (2007), workforce studies or employer surveys collect data about business characteristics, such as the size of the industry, the benefit of offerings for its employees, and the enrolment and characteristics of its workforce. According to Dimensional Research (2020), a workforce survey helps understand employees' work experiences and nature. However, the above definitions may not have captured the essence of workforce studies. Therefore, a new definition for workforce studies is needed to help in the collaborative understanding of the concept.

Hence, workforce studies may be referred to.

“as labour market studies, employment studies, or workforce surveys that are used for researching and analysing data from several aspects of the workforce in an organisation, industry, or region, which can be utilised by business owners, policymakers, or other relevant stakeholders to arrive at decisions that will help to improve the organisation's performance”.

Literatures has introduced several aspects of human resource management in an organisation for measuring workforce studies, such as well-being, diversity and inclusion, leadership, and knowledge management. A brief discussion of each can be seen below:

2.1.1 Diversity and Inclusion

Diversity refers to the level at which individuals in an organisation differ. Diversity could be expressed as the nationality, culture, values, education, ability to perform duties, religion, and personal goals of an individual (Gonzalez & Zamanian, 2015). Inclusion involves making individuals or employees feel a sense of belonging, especially those who feel that they do not belong in the organisation's mainstream (O'Donovan, 2018). Diversity includes valuing and respecting old and new employees' cultures. Also, inclusivity in the organisation helps to increase the level of commitment of employees towards the actualisation of the organisational goals. Combining diversity and inclusion in an organisation ensures a good working environment that fosters flexibility and choice (O'Donovan, 2018).

As work surveys aim to understand employees' perception regarding their satisfaction levels, diversity and inclusion plays a crucial role in measuring their satisfaction level. Dziuba et al. (2020) stated that workplace surveys for companies that encourage diversity and inclusion positively impact employees' job performance. Noon & Ogbonna (2021) showed that achieving organisational goals depends on employee diversity and the inclusive nature of the organisation. One of the benefits is that labour diversity and inclusion enhance individual performances, which increases the organisation's productivity level (Noon & Ogbonna, 2021). In addition, Rafaqat et al. (2022) showed that diversity in the workplace improved organisational performance. Therefore, measuring the level of diversity and inclusion in organisations is integral to assessing and understanding their level of performance, which will help inform ideas to make relevant decisions that will enable the organisation to achieve its goals effectively.

2.1.2 Leadership

Leadership in an organisational context refers to an essential managerial skill viewed as a motivating force to encourage a group of individuals towards actualising a common organisational objective (Akpaprep et al., 2019). Leaders are responsible for putting everything in place to improve and achieve organisational performance; this includes motivating the employees, ensuring that a suitable work environment is maintained, providing adequate compensation for the employees, ensuring adequate planning and organisation at workplaces, establishing and maintaining adequate communication among the subordinates (Akpaprep et al., 2019). The importance of leadership behaviour is emphasised by Hamour (2023), who

explained that poor leadership style might negatively influence employees' creative behaviour, resulting in unhappiness and poor retention. Hence, the study explored leadership styles adopted in organisations, such as transactional and transformational, that can influence the employees' motives to achieve organisational goals.

Sonmez Cakir & Adiguzel (2020) analysed the effectiveness of leadership in organisations, which is vital to improving organisational performances. The analysis indicated that leadership effectiveness significantly correlates with knowledge behaviour, firm strategies, and job performance (Sonmez Cakir & Adiguzel, 2020). Considering the relevance of leadership as a factor that enhances organisational performance, it is vital to analyse such factors using workforce studies. Hence, technological developments have been incorporated to measure the leadership style adopted by organisations (Barthakur et al., 2022).

2.1.3 Well-being

Well-being is another essential factor that needs to be considered in workforce studies. Smith & Holden (2016) explained that the concept of well-being focuses on the individual's overall health. Well-being in the context of an organisation aims to ensure that employee well-being is safeguarded to motivate them to deliver their work effectively and freely (Senthil & Lokesh, 2021); this involves both physical and mental well-being, which are also referred to as corporeal and cerebral states. Physical well-being includes access to ventilation, lighting, temperature control and other things affecting the body (Senthil & Lokesh, 2021). Mental health well-being refers to other factors, including relaxation time and space and adequate working conditions, which ensure that the mental status of the workers is adequately maintained (Senthil & Lokesh, 2021).

Apart from individual well-being, organisational well-being has been identified as a crucial aspect in the literature. Musikanski et al. (2019) study explained the concepts of organisational well-being, which refers to the overall state of the organisation's health comprising of employee psychology, job-associated experiences, job satisfaction, professional and personal growth, and employee happiness. The relevance of well-being as a significant factor is also expressed in the study conducted by Pradhan & Hati (2022); the study aimed to use exploratory and confirmatory factor analysis to develop and validate a scale used in measuring the well-being of employees. The study indicated that the exploratory factor analysis helped achieve other domains of employee Well-being, such as social, psychological, subjective and

workplace well-being (Pradhan & Hati, 2022). Therefore, as a result of well-being directly affecting organisational performance, it is necessary as a factor in work surveys or work studies because its measurement will be relevant to improving organisational performance.

2.1.4 Knowledge Management

Knowledge management is among the relevant factors to be considered in workforce studies. According to Abubakar et al. (2019), knowledge management is a careful approach that optimises an organisation's knowledge economy, and it comprises human resource practices, technology, organisational culture, and structure. Akeke et al. (2023) explained that knowledge management is a significant aspect that fosters organisational performance, as it aids the capability in a company's functioning and operational aspects. In addition to the components of knowledge management mentioned by Abubakar et al. (2019), Akeke et al. (2023) reported other relevant concepts in knowledge management, which include knowledge acquisition, storage, and use. Therefore, knowledge acquisition is another relevant factor that needs to be assessed by workforce studies, as existing studies have shown that knowledge management is essential for optimising organisational performance.

2.2 Role or importance of workforce studies

Workforce studies or surveys are beneficial to improving organisational performance. Gu & Chi Sen Siu (2009) conducted a survey to understand the benefits associated with employees' job satisfaction. The study findings indicated that the survey tool was relevant in measuring the job satisfaction level of the metallurgical employees. The study reported that the satisfaction level translated into the workers' productivity. Hence, workforce studies are relevant in ensuring that the employees' productivity is measured, which is relevant to improving employee satisfaction and organisational performance. Also, Hummels & van der Put (2023) conducted a well-being workforce survey in the Netherlands to determine the relationship between employees and their company's commitment to well-being; the survey had 420 small and medium-sized participants.

The study results showed that the employees reported that the Netherlands companies were significantly committed to their well-being (Hummels & van der Put, 2023). In addition, Huebner & Zacher (2022) conducted a review study on employee surveys. The study identified that employee surveys are essential, as they help ensure adequate support for organisational development; the study also referred to the follow-up process after surveys,

which includes developing an action plan that can increase the trust in conducting those surveys. Therefore, the study indicates that workforce studies are essential to improving organisational development. Surveys can measure employee engagement levels, helping organisations understand how satisfied and committed employees are to their work.

Employee engagement levels in the organisation can assist the management or leadership in understanding how much the employees are committed and satisfied with their job positions. This indicator is essential for organisations to maintain a positive work environment and retain experienced and talented employees. Moreover, Petrova et al. (2016) stated that most workforce studies are conducted anonymously, which can encourage sharing of sensitive concerns and issues in the work environment. Some sensitive concerns can be discrimination, harassment, bullying, and other issues.

Dobbin & Kalev (2022) pointed out that many organisations now focus on ensuring their workforce is diverse. However, measuring the employees' culture and values is important to ensure they align with the organisational culture; workforce studies can help achieve this. Also, having a clear understanding of employee culture can assist the management in building an inclusive work environment. Furthermore, Liu et al. (2023) stated that this can encourage employees from different backgrounds to share their opinions and ideas, cultivating creativity and innovation in the workplace.

Zavyalova et al. (2022) stated that the data received from the workforce studies can be used to measure the progress against the organisation's strategic goals. Also, when the management wants to make decisions, the insights received from the workforce studies could be helpful. Knapke et al. (2022) also stated that the work insights from the workforce studies could be a starting point for conversations related to enhancing workplace strategies among the leadership and employees.

2.3 Comparison of existing methods.

Keemink et al. (2022) and Malau-Aduli et al. (2022) specified that, generally, workforce studies are performed using interviews, questionnaire, observations, and focus groups. Literature has identified several benefits and drawbacks of the currently used methods, as seen in the table below.

Table 2. Benefits and drawbacks of the workforce study approach (Keemink et al., 2022; Knott et al., 2022)

Data collection method	Benefits	Drawbacks
Interviews	<ul style="list-style-type: none"> • Allows detailed exploration by in-depth understanding. • It is flexible. • It can help build trust. 	<ul style="list-style-type: none"> • It is time-consuming. • It is subjective. • The sample size is usually limited. • The workforce is not willing to participate. • Fear of getting ostracised, discriminated against, or losing a job due to giving their honest opinion.
Questionnaire	<ul style="list-style-type: none"> • It is easy to reach out to many people. • Results are easily quantifiable. • It is cost-effective. 	<ul style="list-style-type: none"> • Lack of trust as the workers do not understand the importance. • Questions can be biased. • It is hard for the workers to express themselves adequately. • The response rate is primarily low. • Lack of flexibility
Observations	<ul style="list-style-type: none"> • Studies the actual behaviour. • No reliance on self-reporting. 	<ul style="list-style-type: none"> • Subjective and observational bias. • It is time-consuming.
Focus groups	<ul style="list-style-type: none"> • Interactive opinions can be aired. • It is usually effective for idea generation. 	<ul style="list-style-type: none"> • Hard to group the workforce. • It is time-consuming. • Facilitator bias.

2.4 Some Recent Tools

Several tools introduced in the literature could be used entirely or at least as a starting point in preparing for workforce studies in an organisation. Two major ones are 360-degree feedback

appraisal and the AGAPE approach. The 360-degree feedback appraisal has been adopted to understand the leadership performance of an educational institution's staff and students. A study conducted by Ugwoke et al. (2023) to identify the relationship between the 360-degree appraisal of university workers and students to assess their leadership performance indicated that the 360-degree tool was relevant to determining leadership performance. Also, many business organisations use 360-degree feedback appraisal within their organisations.

A more recent approach is the AGAPE approach reported by Hummels and van der Put (2023). The study showed that organisations are committed to their employees' well-being, as the AGAPE approach increases employees' happiness and improves their performances by defining the organisation's commitment level to the workers' well-being. However, AGAPE is still relatively new, unlike the 360-degree appraisal, which many organisations widely use as it helps improve organisational performance.

3 Chapter 3: Gamification

Gamification has been understood as a process that increases users' motivation and allows for achieving expected goals through gaming elements (Mahadi, 2023). This chapter provides an overview of gamification by describing the definition, evolution, concepts, application reliability and validity of data generated through gamification. The primary focus of this chapter is to discuss the relevance of gamification in workforce studies by understanding the application of gamification in work-related settings.

3.1 Definition and evolution

Several authors have defined the term gamification. According to Faiella & Ricciardi (2015), gamification refers to elements of games that are adopted to improve retention and does not refer to using games for non-entertainment purposes. Gamification may also be defined as using game designs in a non-gaming environment, such as increasing students' motivation for learning by introducing gaming designs into educational materials (Hyrynsalmi et al., 2017). Gamification elements can be used to obtain data to help discern human behaviours when using a particular service (Hyrynsalmi et al., 2017). Shoubashy et al. (2020) defined gamification as introducing game design elements in a non-game environment or context, voluntary and enjoyable activities, and service provision that complements the user's value creation.

Another study by Naseri et al. (2023) understood gamification as applying game elements in a non-game environment to improve user interaction and motivation by disrupting the users' behaviours or intentions by taking advantage of their individual and social factors. Also, Mahadi (2023) explained gamification as a process that increases users' motivation and allows for achieving expected goals using gaming elements (Mahadi, 2023). The author also applied the concept of gamification to teaching method. He showed that gamification could be understood as a technique by which game designs and theories are introduced to other environments, like the teaching or learning environment, to motivate those students to participate increasingly in learning and acquiring new skills.

According to Yang et al. (2023), gamification provides a game-like experience that improves engagement and has proven relevant in marketing and business performances. It was also called an information system that motivates and persuades users to engage in business activities, allowing gaming elements to facilitate businesses (Yang et al., 2023). The above definitions point to a particular explanation that gamification refers to adopting gaming elements into a

non-gaming environment, which could be in business, marketing, teaching, and other organisations to improve users' motivation, performance, and engagement. However, the above definitions do not provide a holistic view of the concept. Therefore, a new definition for the concept was developed, which is that gamification refers to:

“to a strategic approach that combines game design elements (such as competitions, rewards, achievements and recognitions), its mechanics, and principles incorporating it into non-gaming contexts (in various fields of life, such as education, marketing, business) to increase motivation, participation and learning usually leaving a positive behaviour or experience for users”.

Gamification design ideas have existed since the mid-2000s because of rapid technological developments and an increase in online-based games that primarily focus on improving human conditions (Shoubashy et al., 2020). Faiella & Ricciardi (2015) reported that the term gamification was introduced in 2002, and it became popular in literature by 2010. However, the conceptual development of gamification was preceded by the term fun-ware by Gabe Zichermann, which refers to changing the customer's attention to interacting with game elements to serve their daily business needs (Shoubashy et al., 2020). Some aspects of gamification tools applied to business involve social software and online games, which have improved users' experiences and increased their interest in participation (Shoubashy et al., 2020).

Hence, Mahadi (2023) and Naseri et al. (2023) reported the application's usefulness in learning and academics. Therefore, the term gamification is not a new concept, and it has gained attention from researchers over time due to its usefulness in improving the user experience and helping towards achieving a desired end.

3.2 Concepts

The gamification concept has been reported and explained in studies over the years. Deterding et al. (2011) summarises gamification elements into five (5) aspects, which include interface design (badges, levels, and leadership board), game mechanics (game design patterns), game design principles, conceptual models (frameworks), and game design methods. The above elements allow for monitoring and ensuring user interactions can be adapted to online business, commerce, health, and learning, which are beneficial to encouraging human behavioural changes (Rodrigues et al., 2019). Vesa & Harviainen (2018) reported that gamification operates

in two ways: hand-choice architecture and hand-humanistic design. The choice architecture is known to control behaviours. It is regarded as micro-agential, likened to a management dashboard that uses game-like incentives to understand individual behavioural patterns (Vesa & Harviainen, 2018). The choice architecture is explained to adopt the humanistic design method to bring about positive actions that improve human experiences (Vesa & Harviainen, 2018).

Furthermore, Rodrigues et al. (2019) explain gamification as having several online game elements, including points, leadership boards, and badges in non-gaming environments to enhance employee and consumer engagement. The above suggests that gamification may adequately improve organisational performance through employee engagement. The concept of gamification may be applicable in many fields of life, such as individual lifestyles, marketing organisations, industries, and academics. The gamification concept can encourage the workforce to aim for leadership positions by introducing benefits in the platform, such as achieving badges, points, and levels (Deterding et al., 2011; Vesa & Harviainen, 2018; Rodrigues et al., 2019; Mahadi, 2023).

Parizi (2016) specified that gamification should focus on human-centric design. Human-centric design is also known as user-centric design, which prioritises the needs and preferences of the users when designing the process (Chammas et al., 2015). The primary goal of this approach is to develop a design that is enjoyable, accessible, and intuitive for the users. Some fundamental human-centric design principles are empathy, user research, accessibility, and iterative design (Dias et al., 2022).

3.3 Application in HR and other sectors

Gamification has been applied in different contexts due to its usefulness. In education, gamification has been applied to improve learning (Sabornido et al., 2022). In the human resource (HR) sector, gamification has been adopted to attract, induct, improve motivation performance, train, develop, engage, and retain employees. It also enhances knowledge management activities and optimises management measures (Murawski, 2021). Many studies have shown the application of gamification in employee recruitment (Zanina et al., 2020; Obaid et al., 2020). Gamification can help improve the performance of online recruitment tools. Some of the benefits of gamification in human resource management include testing the skill set of the job candidates, such as their innovative ability, creativity, and time management;

conducting interviews and screening of job candidates/applicants; and understanding applicants' attitudes and behaviours through the use of simulation examples (Zanina et al., 2020).

Studies have highlighted the benefits associated with gamification in employee training (Silic & Lowry, 2019; Obaid et al., 2020). Silic & Lowry (2019) showed the relevance of gamification in security training and compliance using gamified systems. The study highlighted the benefits of using the gamified element to improve employee capability and motivation to work effectively, which resulted in improved organisational performance. It reported that the system enabled them to understand the employer's mindset, as they reported that employee behaviour is motivated by intrinsic factors. Although no bonuses or financial benefits were associated with the gamification design, the gamification system made the employees happier, and their willingness to participate increased substantially (Silic & Lowry, 2019). Subsequently, Obaid et al. (2020) conducted a literature review to determine the role of gamification in recruitment, engagement, and employee training. The study highlighted that gamification is a desirable tool adopted in organisations to successfully address the critical elements of the job processes: recruitment, engagement, and staff training.

However, the study reported some challenges encountered in job recruitment and training, as it requires more serious games to solve problems in work organisations adequately (Obaid et al., 2020). It also reported that most of the studies reviewed were not specific to a particular audience but were generic, referring to the general population (Obaid et al., 2020). Although the two studies indicated the usefulness of the application of gamification tools in the training workforce, Silic & Lowry (2019) were particular about using gamification to increase the internal desire of employees to achieve goals achievement. In contrast, Obaid et al. (2020) were particular in determining the challenges that could be addressed to ensure that gamification improves employee performance by focusing on job recruitment and training.

The work of Caserman et al. (2023) aims to determine the level of acceptance of gamification among different generations of individuals in large organisations. Generation X refers to people born between 1965 and 1978, generation Y refers to people born between 1980 and 1994, and generation Z refers to people born between 1995 and 2009. The study reported that Generation Z employees enjoyed gamification more than the older employees from Generation X or Y. Gamification has seen its fair share of acceptance in the marketing industry to promote the marketing of products, services, and brands. It has been applied in different forms, which

include video games, augmented reality, virtual reality, and mixed reality (Yang et al., 2023). Another study by Ozdamli & Milrich (2023) reviewed the literature to investigate the application of gamification in the fitness industry.

The study identified that gamification positively impacted the motivation, engagement, user experience, interactions, and rehabilitation techniques aspects of the participants' physical activities (Ozdamli & Milrich, 2023).

Generally, published studies have reported certain barriers that might hinder the performance of the application of gamification in organisations. They include compliance, poor access to technology, ethical concerns, poor managerial knowledge, and many others (Ozdamli & Milrich, 2023). Another study by Sabornido et al. (2022) reported some challenges experienced in using gamification in learning, including inadequate participation, uncompleted tasks, compromising performances, and attitudinal problems. Although gamification can potentially improve recruitment and work performances, those identified challenges, such as individual differences and targeting specific audiences, must be addressed to improve workforce performances of industries effectively.

3.4 Reliability and validity of data

Wirani et al. (2022) and Baydas & Cicek (2019) have discussed the usefulness of gamification, focusing on the reliability and validity of the data it could generate. Also, Marques et al. (2020) stated that adoption would increase if the data generated from the gamification strategies are reliable and valid. Ozdamli et al. (2019) conducted a study with 360 students to develop a scale that may be capable of determining students' opinions during the learning process that utilises gamification software. The study findings measured the reliability and validity of the data provided and found them reliable.

Other studies have also reported the benefits associated with using gamification data. Hidayat & Abdurachman (2022) investigated the performance of technological companies concerning the adoption of gamification to determine whether there is a relationship between gamification and the company's performance. The study findings showed that gamification improved the company's performance against its non-adoption, proving that the output is valid. The study also reported that entrepreneurial culture and knowledge facilitated the influence of gamification on the company's performance.

Also, another study by Yang et al. (2023) showed that gamification has proven beneficial in improving user experiences in the marketing industries. These and other studies (Benitez et al., 2022; Bahadoran et al., 2023; Palmquist, 2023) have shown the benefits of gamification in improving organisational and workforce studies, thus indicating that gamification tools could be valid and reliable.

3.5 Concerns in HR management

Literatures has identified several concerns and possible issues that could be faced when the gamification approach is adapted to human resource management. Some of these are discussed below.

- **Employee deception:** It is possible that employees can purposefully provide false information within the gamified platform to manipulate the leaderboard to receive benefits such as salary negotiations. Hence, the reliability of the data gathered through the platform is questioned. However, as Offergelt & Venz (2023) stated, the possibility of this deception is relatively lower than in traditional approaches to workforce studies.
- **Technology disparity:** Gamification is a concept that the younger generation is more used to than the older generation. Therefore, the younger workforce may have an advantage over older workers due to their advancement in technological skills (Zhang et al., 2022).
- **Equal starting position:** To introduce a gamification strategy, it is essential to consider how to create an equal starting position for all users, especially when they come from very different backgrounds; this is a serious and challenging problem and concern (Blanco et al., 2023).
- **Discrimination and bias:** The game design can favour certain types of people or some majority users, ignoring the interests of the minority users. Also, limited customisation of the gamified platform can cause user bias (Modirrousta-Galian & Higham, 2023).

4 Chapter 4: Cyber-security and Privacy Concerns

As the number of internet users continues to increase, cyber theft and privacy violations have also increased proportionally, leading to increased focus on cyber-security and privacy concerns. It is essential to protect data and the activities of individuals online as the threats to individuals, businesses, organisations, and government agencies continue to increase (Seemba et al., 2018; Mishra et al., 2022). This chapter will focus on the importance of cyber-security and privacy. It will provide the definition, risk management, legal and ethical perspectives, and a comparison of the laws and acts applicable in different key regions.

4.1 Definition

Since the current study focuses on cyber-security and privacy, it is essential to define the concepts of cyber-security and privacy. The term cyber-security, as explained by Seemba et al. (2018), is the protection of all the components of the systems involved in internet connections, such as the hardware, software, and data, from any cyber-attack. Also, Bahamid & Doh (2017) understood cyber security as a tool that prevents unauthorised individuals from accessing information organisation stores in their systems. Bahamid & Doh's (2017) definition is related to Seemba et al. (2018), as the two authors understood cyber security as a tool that protects or prevents attacks on systems. However, a more recent study provided a broader understanding of the topic. According to Mishra et al. (2022), cyber security is a security keyword for ensuring that an organisation's cyberspace is protected from attackers, which involves policies, tools, guidelines, risk management procedures, and training. Therefore, the definition of cyber security for the current study refers to the tools, procedures, and methods that help protect an organisation's cyberspace from attacks and threats.

Another concept of importance to the current study is privacy. Privacy issues involve protecting online users' sensitive information (including staff and consumers) from hackers and unauthorised individuals (Sun et al., 2015). According to Pelteret & Ophoff (2016), privacy is complex and dynamic and commonly associated with personal information. Also, Privacy is multifaceted and has other synonyms, such as secret, solitude, confidentiality, anonymity, liberty, and many others (Pelteret & Ophoff, 2016). Sun et al. (2015) explained that data security and privacy protection are two main concerns. According to Sun et al. (2015), individuals or groups share information within themselves secretly by considering when (getting future information rather than past ones), how (method of requesting information), and

to what extent (mode of disclosing information). The concept of privacy could be applied in different organisations and industries (Sun et al., 2015; Gupta et al., 2023).

The commerce industry protects its consumer's details (Sun et al., 2015). Also, other organisations have provided laws, mechanisms, standards, and processes to address privacy concerns while managing the organisation's information (Sun et al., 2015). Gupta et al. (2023) showed how privacy is applied in the health sector. According to Gupta et al. (2023), privacy is implemented in the healthcare sector to help ensure that patient data is secured. Areas in which privacy is considered in the healthcare sector include patient access to physicians, information transmission, and patient care quality (Gupta et al., 2023).

The above studies have defined the concept of privacy and showed areas where privacy concerns are considered. However, the definition of Sun et al. (2015) provided an elaborate definition of privacy by using examples and applying them in different contexts. Hence, the current study understood privacy in the context of cyber usage as a way of protecting users' sensitive information to ensure they are not leaked or hijacked by cyber criminals to be used against the user's will.

4.2 Risk Management

Risk management is among the concepts utilised in cyber security and privacy. The concept has been applied in several contexts; for example, Bahamid and Doh (2017) applied the concept of risk management to the context of construction projects. According to Bahamid and Doh (2017), the term risk management refers to the process involved in analysing, identifying, and responding to the risks involved in a particular project. Melaku (2023) applied the concept in cyber security. According to the study, cyber risk management involves the step-by-step process of identifying potential threats to an organisation's security (Melaku, 2023). It also involves analysing and assessing the threats identified, classifying them, identifying the vulnerable aspects of the system, and putting into action or implementing strategies (Melaku, 2023).

The term cyber risk management also encompasses cyber risk assessments and needs to be considered due to the IoT on cyber activities (Lee, 2020; Ding et al., 2023). According to Ding et al. (2023), risk management involves risk identification and assessment strategy, risk estimation strategy, and prioritisation strategy. The risk may also involve recognising, analysing, and putting effort into managing the risks recognised to ensure that adequate

efficiency and effectiveness of the industry performance are achieved (Damayanti et al., 2023). Hence, improving organisational risk management strategies will help improve the value they create and meet the contemporary challenges of modern organisations (Damayanti et al., 2023).

However, the above definitions are not collaborative or generic, as they focus on a particular sector; thus, they are not encompassing. A new definition that could be collaborative and encompassing other fields is required. Therefore, the concept of risk management may be understood as a process that can be adopted by several companies and organisations, which involves the identification of potential risks, threats, or problems that may affect the performance of an organisation or company in the future while also allowing for the analysis, and development of the strategies to address the potential risks.

When adopted in cyber security, the current definition entails identifying threats that might result in information leakage or blocking unauthorised individuals from evading an organisation's system and formulating strategies to mitigate such risks to avoid their potential negative impact on the company's performance.

Several risk management standards have been made available to guide organisations in managing potential risks in different sectors, which include the International Organisation for Standardisation/International Electrotechnical Commission ISO/IEC 27005 (Lee, 2020; Melaku, 2023). ISO/IEC 27005 is a set of standards developed by the International Organization for Standardization and the International Electrotechnical Commission (IEC) to provide managers with guidelines and methods for management of security risks that might have the potential to affect the company's performance (Melaku, 2023). Another strategy uses the seven stages of the Cyber Kill Chain (CKC) framework, a risk management framework that provides information regarding the cyber attacker's actions (Lee, 2020; Melaku, 2023). Lee (2020) reported an Enterprise Risk Management (ERM) system as another approach that may be relevant to cyber security risk management.

Another framework is the Risk Information Technology Framework, which provides guidelines and standards to help manage risk using a cybersecurity systems management framework, providing information regarding the cyber attacker's actions (Lee, 2020; Melaku, 2023).

The systematic review by Cremer et al. (2022) established the need for risk management in cyber security. This is because globalisation, digitisation, and technological advancements

have increased cybercrime. The study aims to understand the role of cybersecurity and cyber insurance in lowering risk levels in organisations by reviewing existing studies (Cremer et al., 2022). The study identified that there is scarce evidence of cyber risk in the research literature, which may affect the stakeholders' effectiveness in managing risks (Cremer et al., 2022). Cyber risk management has also been reported to be essential in small and medium enterprises. Alahmari & Duncan (2021) aimed to understand the role of small and medium enterprises in managing risks. The study identified different concepts used in risk management: threats, behaviours, practices, knowledge/awareness, and making decisions (Alahmari & Duncan, 2021).

Therefore, the above studies have shown that the concept of risk management is beneficial for cyber-security and privacy concerns, as it enables the identification, analysis, and effective management of the potential risks to address potential risks (cyber threats, cyber attackers, and information leakage) that might affect modern organisations' performance.

4.3 Legal and Ethical Perspective

Legal and ethical research perspectives are important research aspects that must be considered. Yip et al. (2016) identified several reports, such as the Declaration of Helsinki, the Belmont Report, the White Paper, and other relevant practices, which have reported various ethical issues that must be considered in writing research studies. According to the study, research is expected to protect life, dignity, human rights, health, privacy, and confidentiality (Yip et al., 2016). The Belmont Report provides an ethical framework that needs to be considered, such as respect for persons, beneficence, justice, and autonomy. Other ethical concerns that should be considered include informed consent for majorly empirical data.

According to Cacciattolo (2015), different ethical issues are considered in research, such as informed consent, deception, privacy, and diverse cultural contexts that may affect the study. Informed consent was reported as the primary aspect of conducting a study in an ethical manner, which can be obtained verbally (from non-educated persons) or through written format (for educated persons) (Cacciattolo, 2015). Deception is another unethical approach reported by Cacciattolo (2015) that refers to the purposeful misrepresentation of research data or the purpose or nature of research. On the other hand, privacy is understood as controlling the information about people who participated in the research.

Jones (2019) highlighted the relevance of collecting big data but also showed that data can be problematic as mistakes or errors could occur during data collection. For example, the study showed that highly trained clinicians could make mistakes in prescription and treatment because of several factors, such as having a hectic schedule, malfunctioning digital devices employed in recording and so on, thereby producing erroneous data that may affect patient outcomes (Jones, 2019).

On the other hand, Yip et al. (2016) study identified other ethical and legal issues that must be avoided in research, such as fraud in research and publication, data fabrication, plagiarism, inadequate maintenance of confidentiality of patient and participants data, legal issues involved in research, data protection (such as the UK Data Protection Act), legal issues involving regulatory bodies and avoidance of bias in research. Existing studies have also shown the benefit of considering ethical and legal issues in research data collection. Cacciattolo (2015) identified several ethical and legal issues in research. For example, when conducting research in areas that comprise people who are non-English speakers, it is essential to avoid ethnocentric behaviours to communicate with the study participants effectively.

Ethical issues in research entail that every study must ensure that participants are safe from harm and adequately protected from other stressors (Hyrynsalmi et al., 2017). However, unethical research influences the participants negatively, as it may make them vulnerable and result in negative feelings, such as being mentally unstable (Cacciattolo, 2015). Nii Laryeafio & Ogbewe (2022) investigated ethical issues in research that are involved in collecting qualitative research data. The study shows that issues relating to anonymity, voluntary participation, privacy concerns, confidentiality of research data, and issues involving the misuse of research findings are relevant ethical concerns for researchers (Nii Laryeafio & Ogbewe, 2022).

As the current study aims to use gamification approaches to improve workforce studies, it is relevant to identify specific ethical and legal concerns involved in collecting online data from users. Facca et al. (2020) identified different ethical and legal issues concerning online research data collection. Some themes generated include obtaining consent, handling research data, minor data rights, gatekeeping, and others (Facca et al., 2020). Other studies relating to the current study have shown the relevance of ethical considerations in gamification designs (Hyrynsalmi et al., 2017; Hyrynsalmi et al., 2018; Hyrynsalmi et al., 2020). Therefore, the

above ethical and legal issues will be observed in the current study to ensure that the study is ethically rigorous.

4.4 Comparing and contrasting laws and acts in different regions.

The following are some key legal frameworks from different continents that should be considered when introducing gamification strategies for workforce studies.

Table 3. Legal Frameworks

Countries	Key regulations
United Kingdom	<ul style="list-style-type: none"> • Data Protection Act 2018 implements the GDPR (General Data Protection Regulation) in the UK. It provides a clear understanding of personal data and individuals' rights. Therefore, this is a key regulation that needs to be considered when introducing gamification for workforce studies, as it will collect, store and analyse a wide range of participant data. • Computer Misuse Act 1990 mainly focuses on illegal activities such as access to illegal materials or any other offences that involve computers. Gamification is a concept that mainly utilises computers. Therefore, it is essential to consider this regulation as well.
United States	<ul style="list-style-type: none"> • California Consumer Privacy Act 2018 provides some regulations that handle California residents' rights to data. Additionally, the Health Insurance Portability and Accountability Act 1996 was introduced specifically for patient data in healthcare organisations. • The Cybersecurity Information Sharing Act (CISA) was introduced to minimise cyber security threats by learning from existing threats and sharing them among organisations.
Europe	<ul style="list-style-type: none"> • General Data Protection Regulation (GDPR) is applied to all European countries to protect personal information and how organisations should handle those data effectively.
India	<ul style="list-style-type: none"> • Information Technology (Reasonable Security Practices and Procedures and Sensitive Personal Data or Information) Rules 2011 provides clear information regarding complex and sensitive personal data and how it should be managed.

	<ul style="list-style-type: none">• Personal Data Protection Bill 2019 was created by leveraging the GDPR to provide clear information on handling personal data in India.
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5 Chapter 5: Methodology

Research methodology refers to the systematic approach of planning, executing, and analysing a study by a researcher (Pandey and Pandey, 2016). It encompasses collecting, organising, interpreting, and arriving at conclusions from the data collected (Kapur, 2018). Therefore, this chapter provides complete information regarding the methodology adopted by the researcher to perform this research study.

5.1 Research Design

Research design is a complete procedure in a study showing the methods, steps, and approaches of data collection and analysis (Sileyew, 2019). A model designed by Melnikovas (2018), known as Research Onion, shows the procedural steps of a research process. It is usually used to describe the iterative nature of research design and the attendant complexities. This model has different layers, each representing a different part of the research design steps, including research philosophy, approach, strategy, choices, time horizons, and data collection and analysis techniques. Figure 1 shows the research onion model and the different layers attached.

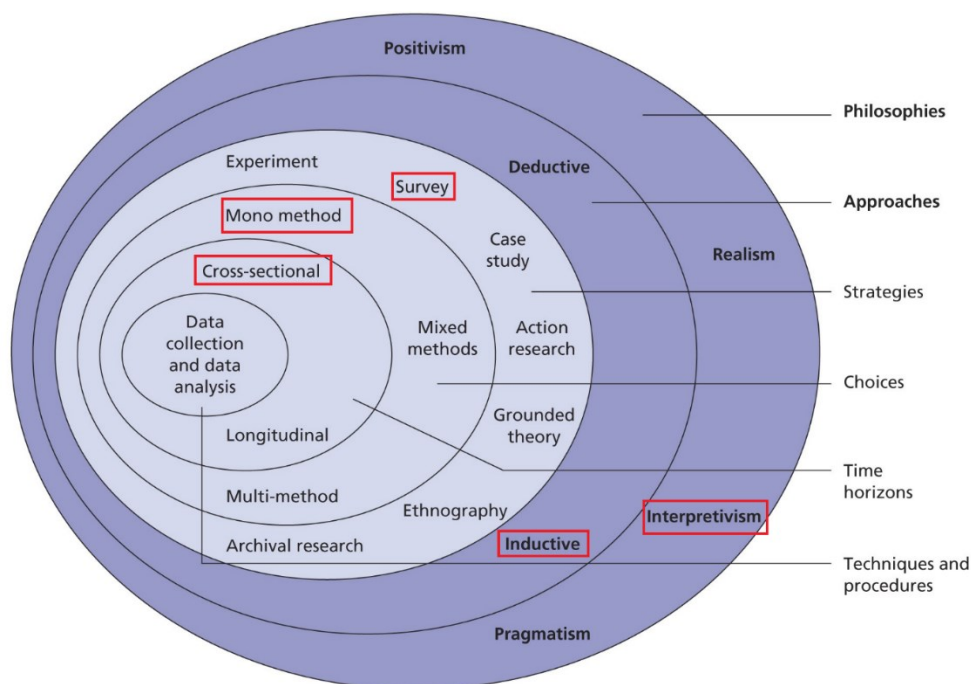


Figure 1: Research onion (Melnikovas, 2018)¹

¹ Melnikovas, (2018) stated that survey is a research strategy type that includes various forms. The two main forms are interview and questionnaire.

5.1.1 Research Philosophies

Literatures have introduced several philosophical approaches: positivism, realism, interpretivism and pragmatism (Ryan, 2018). Positivism emphasises empirical and verifiable data to study and understand the social world (Ryan, 2018). Positivism is not selected for this study because it is primarily suitable for quantitative research methods. On the other hand, realism is premised on objectivity independent of the human point of view; however, it considers that human understanding could be partial and at the mercy of individuals' interpretation (Ryan, 2018). Even though this approach is widely used for interviews, it is primarily for interviews that capture the participants' experiences related to the subject matter.

Also, pragmatism focuses on practical outcomes of ideas and actions and is used mainly in practical-based outcomes (Ryan, 2018). Lastly, Interpretivism is a social reality formulated by an individual using the lens of their own interpretation of the world (Potrac et al., 2014). It depicts the significance of an individual's comprehension of meanings, symbols, and their subjective view. Although it is also known as constructivism or symbolic interactionism, it is usually adopted in a practical-based result, such as interviews - especially the qualitative interview, due to its emphasis on the significance of comprehending the participants' subjective interpretation and meanings. Additionally, this type has a strong benchmark for exploring profound human experiences and social concepts using an in-depth interview. Hence, the *interpretivism philosophy* is selected for this work.

5.1.2 Research Approaches

Literature has introduced two primary research approaches, which are deductive and inductive (Azungah, 2018). The former encompasses specific theories or hypothesis testing as it transverses through general assumptions to specific conclusions and confirms correct or false theories through hypothesis testing. Alternatively, the latter encompasses drawing a general conclusion based on specific observations (Azungah, 2018). The inductive approach uses a bottom-up approach that begins with specific data or theory and then transverses to developing general principles or conclusions (Sangiovanni & Lavagna, 2007). Using this approach, the scholars start with specific details and end by making a general conclusion premised on the data trends.

This study utilises an *inductive approach* because it is interview-based. An inductive approach explores the participants' reality, viewpoints, and meanings. The inductive research approach

permits the researcher to understand the data, figure out the inherent themes, and formulate theories based on the participants' outlook. An interview is an excellent tool for getting the participants' rich and profound experiences and viewpoints. Furthermore, interviews allow for novel information and unanticipated findings, bringing about a richer comprehension of the concept being investigated.

5.1.3 Research Choices

There are 3 major research choices researchers can use: mono method, mixed methods, and multi-method (Vivek & Nanthagopan, 2021). The mixed method is used for research that combines qualitative and quantitative methods (Östlund et al., 2011). Multi-method also uses multiple methods but does not place much effort into quantitative and qualitative data integration (Dupin & Borglin, 2020). However, the mono method is when the researcher uses just one approach through the study's lifecycle. Data is collected and analysed using either a qualitative or quantitative approach to answer formulated research questions or test hypotheses (Vivek & Nanthagopan, 2021).

The *mono method* is chosen here because the formulated research question is best answered with the method due to its clarity to the study. Also, it aids researcher concentration, as direct interpretation of the outcome is ensured, thereby reducing ambiguity. Also, it helps to efficiently use funds, time, and human resources, as training and expertise are based on one method. According to Bickman & Rog (2008), there would be no need to employ multiple methods if one research method could effectively answer the posed research question, thereby reducing the research complexity.

5.1.4 Time Horizons

A research study can follow two types of time horizons: cross-sectional and longitudinal (Koufteros et al., 2014). The former is about observational research analysing the obtained data from the population or subset representative once at a time. It presents a population's behaviour, characteristics, or condition in a certain period of time (Koufteros et al., 2014). Alternatively, the latter is about repeated observation or measurement of individual or group behaviours at a different time series. A researcher can identify and track trends over some time. Unlike the longitudinal, the current study follows a *cross-sectional approach* because it consumes less resources and time. Also, data is obtained once, which is practicable and reduces

cost. Furthermore, the result is rapidly generated; as such, the research question about the characteristics of a sample population is answered immediately.

5.2 Data Collection

Data collection is a systematic and structured method of collecting information and measuring different variables to answer the formulated research question, evaluate results, and test the hypothesis (Ghauri et al., 2020). Based on the need and direction of the research, the data may be collected qualitatively or quantitatively. Based on the need and direction of the research, the data may be collected qualitatively or quantitatively.

5.2.1 Data Collection Approach

There are two types of data: quantitative and qualitative (Almalki, 2016). The former is numerical, as its values can be statistically measured and analysed. Through numerical analysis, variables can be quantified, and relationships examined. Experiments, statistical measurements, and questionnaire are the most common methods for quantitative research. However, the latter involves collecting non-numerical data and describing the attributes, characteristics, and qualities (Almalki, 2016). It is usually about analysing the participants' subjective attitudes, beliefs, behaviour, and experiences. Content analysis, focus groups, interviews, and observations are the most common methods used in collecting qualitative data.

This study collects *qualitative data* as deep information about the complex concept is derived, allowing the researcher to explore the uniqueness of human experience within the phenomena. It helps to understand the meanings, nuances, and subtleties that are difficult to quantify. It is also appropriate for exploratory research and understanding the inherent reasons for the studied concepts. With it, a researcher can comprehend some behavioural context, as a holistic view of the concept is considered with the eyes of cultural, environmental, and social factors that could impact the result. It is also flexible for data collection, as the researchers can adapt their approaches based on evolving information.

A *face-to-face interview approach* is adopted to collect qualitative data for this study, and it encompasses direct conversations with the research subject to collect their view on a subject matter. The interviews were conducted in private virtual meetings using Zoom and Microsoft Teams. Therefore, this private setting allowed the participants to comfortably share their personal experiences and options. The main reason for the researcher to select the interview

approach is that this study requires a thorough understanding of some ideas contextually. Interviews give the researcher rich, insightful, and context-based information, as the researcher leverages this to get intricate information from the experience and environment of the research participants.

The *open-ended questions* utilised for this study are mapped to the respective objectives to ensure no repeat questions were asked. Also, not all the questions were asked of all the participants; the selected questions for the participants were chosen based on their expertise. There were several questions asked during the interview of this study (See [here](#)).²

5.2.2 Data Collection Instruments

In interviews, different instruments can be used to collect necessary data. However, this study utilises two significant instruments: *interview guides* and *open-ended questions*.

An interview guide is a systematic procedure guiding the interview session based on an outline of topics and questions that participants need to answer (Kallio et al., 2016). It allows the interviewer to be consistent with the questions, which helps to focus on important questions. Open-ended questions have no structured response, as participants are at liberty to give comprehensive and subjective information, supplying information based on their viewpoints and experiences using their words (Azungah, 2018). Also, it encourages the participants to provide in-depth and detailed responses, captures a wide range of perspectives from the participants, ensures authenticity and validity, assists in forming themes, encourages participant engagement, raises participant empowerment, provides flexibility and adaptability, and is suitable for diverse audiences.

5.2.3 Sample Population

A total of 123 potential participants were initially invited to take part in the interviews. Of this pool, **82 participants** willingly agreed to participate, forming the sample population for the interview phase. Given the qualitative nature of the study, the sample size of 82 participants is deemed adequate for achieving the research objectives. The focus is on obtaining in-depth insights into participants' perspectives, allowing for a thorough exploration of themes and patterns related to the research questions.

² <https://shorturl.at/dpyAO>

Arguably, some limitations are the inadequate representation of the broader population and the need to interpret the findings using a non-probability sampling approach thoroughly. However, the researcher believes that the responses received were sufficient as there was a saturation in the responses. There can be saturation in qualitative research, which is where new data does not provide new and relevant information to the research question (Guest et al., 2020). At this stage, it can only mean enough data has been collected to deal with and investigate the subject matter. At the saturation level, data is now repetitive, which means a waste of time collecting more, as no substantial information can be derived anymore.

However, in a qualitative study, especially with an in-depth interview method, saturation is critical and good for determining when to halt data collection. It means the researchers have been able to underscore the subtleties in the study through themes and trends identification, and collecting more data will only reinforce previous observations. After this stage in a qualitative study, the following stage is meant for confirmation, which is a stage in which more data is analysed and interpreted with the aim of theme, trends, and idea validation and reinforcement (Guest et al., 2020). Although what exceeds exploration is carried out in the initial phase, it is more convincing that the derived information is concrete and comprehensive. The *saturation point* of this study can be seen in the figure below. The figure below indicates that the saturation of the responses started approximately from the 74th participant upward. However, the researcher conducted an additional 8 interviews to *confirm* the responses received.

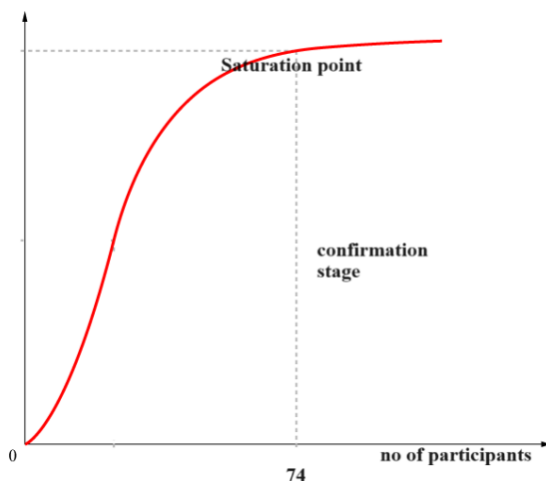


Figure 2. Participant responses

5.2.4 Sample Selection Approach

This study utilises a *convenience sampling approach* to select the participants for this study. It is a non-probability sampling approach in which participants are chosen because they are readily available and accessible. Instead of being chosen at random, they are selected because they are closer to the researcher, not necessarily by distance but via social networks (Vehovar et al., 2016). This method is usually adopted when research intends to rapidly and efficiently collect data by bypassing the rigour of sampling method implementation. Some of the convenience sampling characteristics applied in this study are listed below.

- **Accessibility:** The researcher chooses the participants due to their easy accessibility.
- **Cost-effectiveness:** It does not require expending many resources, which helps to reduce cost, making it better than other methods, which may be complex.
- **Informal selection:** There are no formal criteria for choosing the participants other than their availability, proximity, and readiness to partake.
- **Time efficiency:** Researchers use this method because of its directness in collecting the needed data, which helps to save time.

This technique is appropriate for exploratory studies, where the primary objective is generating the initial information and hypotheses, making it easier for the researcher to collect data that helps develop comprehensive research questions.

5.2.5 Demographics of the participants

The following demographic factors of the participants were gathered during the interview, which is used to indicate suitable clusters during the analysis of the responses.



Figure 3. Demographic factors

A brief discussion of the demographic statistics of the participants is provided below.

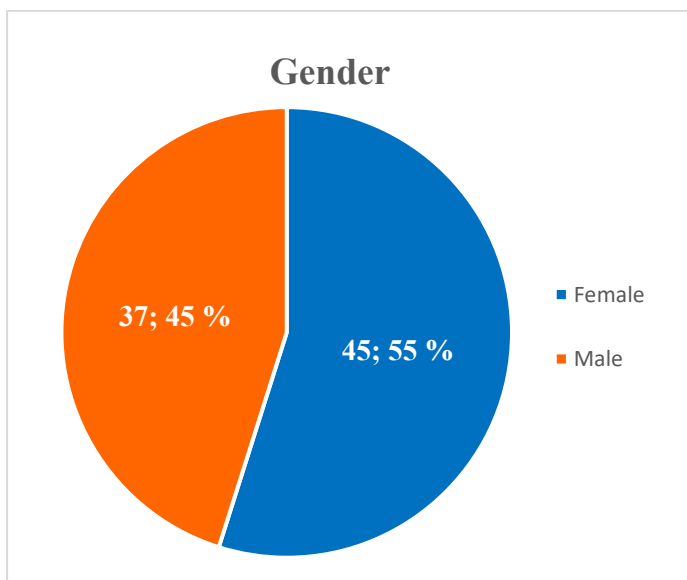


Figure 4. Gender distribution of the participants

This figure represents the distribution of the participants' genders and shows a close margin between both genders. However, there were more female participants than their male counterparts. The 10% margin is not large enough to create a consequential skewness. As such, the level of imbalance cannot produce substantial bias in this study as the study is not premised on the accuracy of the gender representation.

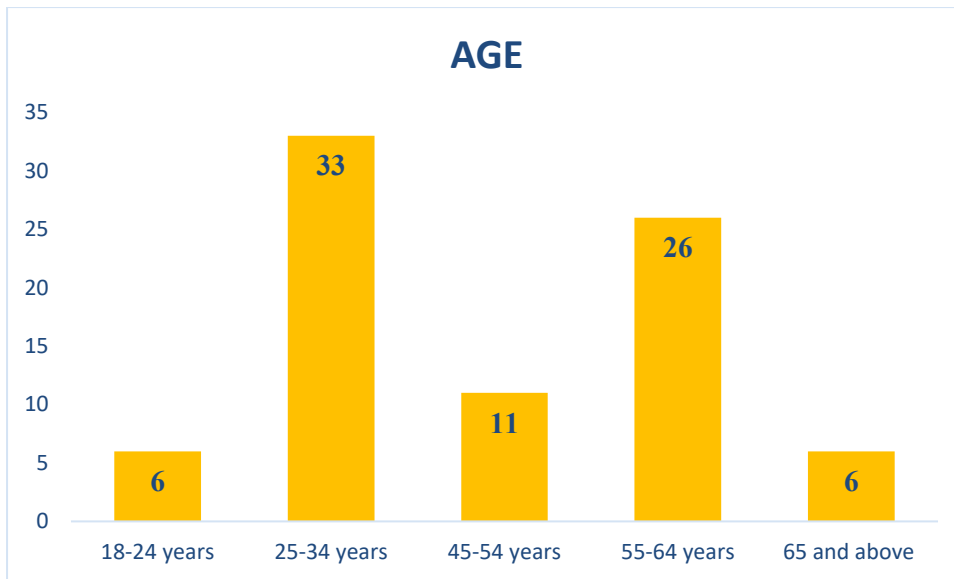


Figure 5. Age distribution of the participants.

This figure represents the age range of the participants in the study, and it shows that a more significant number of participants belong to the 25 - 34 age range, with a total number of 33 participants. This information indicates that most participants are in their mid to late twenties and early thirties.

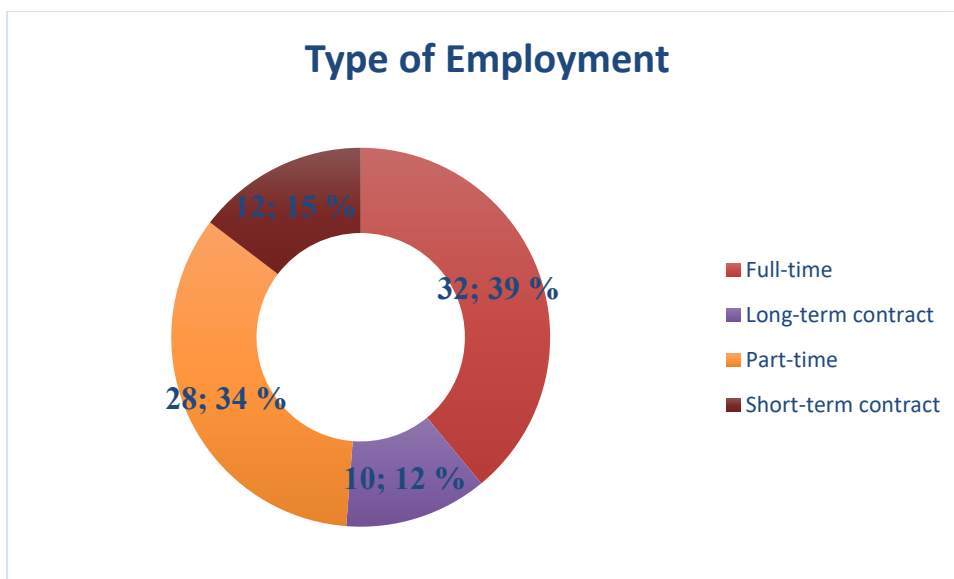


Figure 6. Type of employment distribution of the participants.

Participants in this study fall into four groups of employment or contract duration groups: full-time, long-term contract, part-time, and short-term contract, with the largest group comprising those in full-time employment, totalling 32 participants, thus indicating a predominant presence in the study. While participants in different contract periods, including long-term and short-term contracts, are also represented, it is evident that the study encompasses a diverse range of employment types and durations.

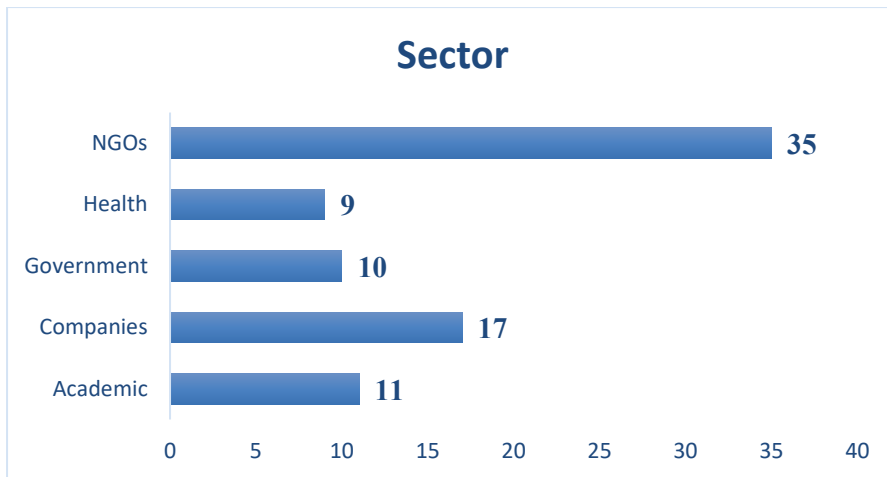


Figure 7. Sector distribution of the participants.

This figure shows the diversity in organisational affiliation present among the participants in this study, spanning Academics, Companies, Government, Health, and NGOs (Non-Governmental Organizations). Within the Academic category were 11 participants associated with research or educational institutions, including universities. The Companies category captures 17 participants engaged across diverse industries within the private sector. In the Government category, 10 participants are represented, indicating individuals working in government agencies or public sector roles. The Health sector includes 9 participants, professionals employed in healthcare organisations or hospitals. Notably, the highest representation is observed in NGOs (Non-Governmental Organisations), with 35 participants; this group comprises individuals engaged in non-profit organisations, advocacy groups, or humanitarian agencies.

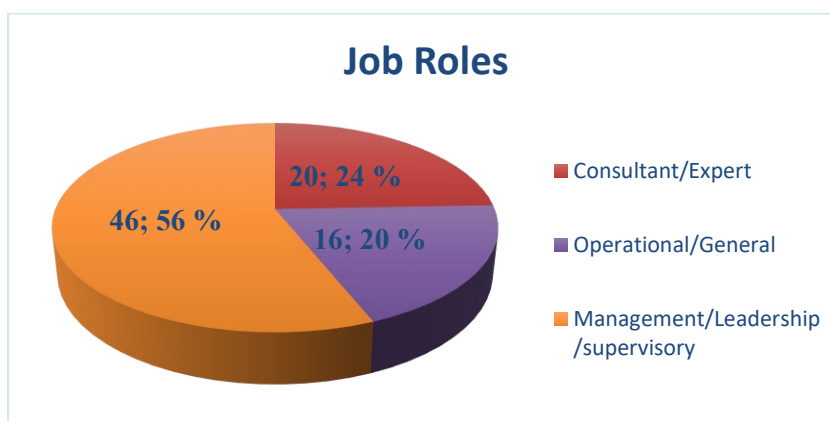


Figure 8. Job role distribution of the participants.

The participants hold different job roles. These roles are grouped into Consultant/ Expert, Operational/ General and Management/ Leadership/ Supervisory positions. Management/ Leadership/ Supervisory position has the highest representation in this study, comprising 46

people, suggesting that those in positions of authority holding managerial and supervisory positions dominate the study. However, those in Consultant/Expert roles are 20 in number; these are individuals who would incorporate specialised knowledge and skills to the study, contributing deep expertise in different and specific areas. 16 participants are in the Operational/General group and are saddled with daily operations. The different role types created a balanced analysis of the variables employed in the study.

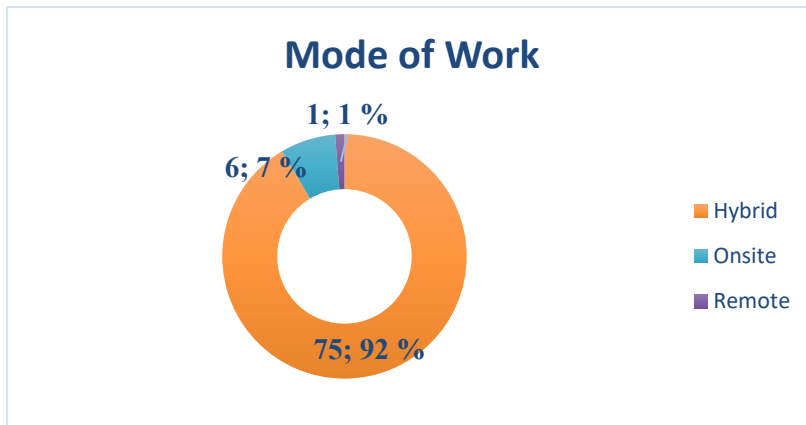


Figure 9. Mode of work distribution of the participants

Most participants, totalling 75, prefer working in a hybrid setting, indicating a prevalent inclination towards a combination of onsite and remote work. In contrast, only 6 participants favour onsite work, and a single participant prefers working exclusively remotely. It suggests that only a small fraction of the participants opt for entirely onsite or fully remote work. The observed trend underscores the growing adoption of hybrid work settings, driven by flexibility—allowing individuals to blend office and remote work seamlessly. Notably, this shift is primarily attributed to the impact of the COVID-19 pandemic, accelerating the acceptance and implementation of hybrid work arrangements.

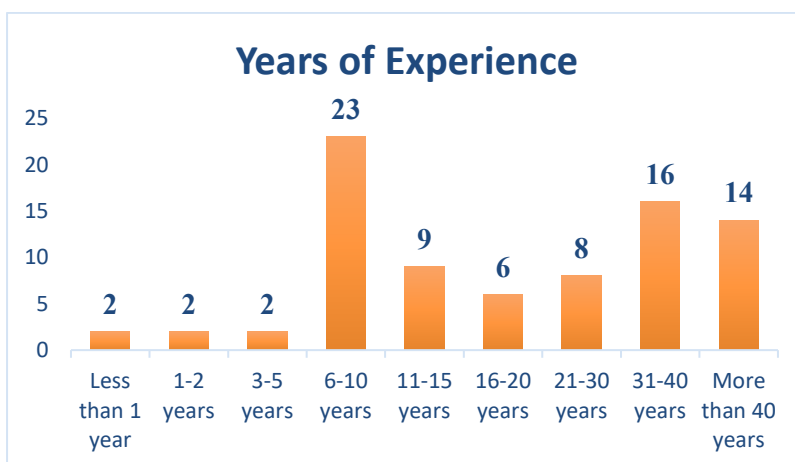


Figure 10. Years of experience distribution of the participants.

The figure indicates that this study has covered participants with a wide range of years of experience, 6 to 10 years of experience being the highest, followed by 31 to 40 years. This distribution allows the researcher to capture broader perspectives from early, mid, and advanced career participants. From the distribution, it is clear that the responses received are suitable for examining the long-term trends and addressing challenges across numerous career stages.

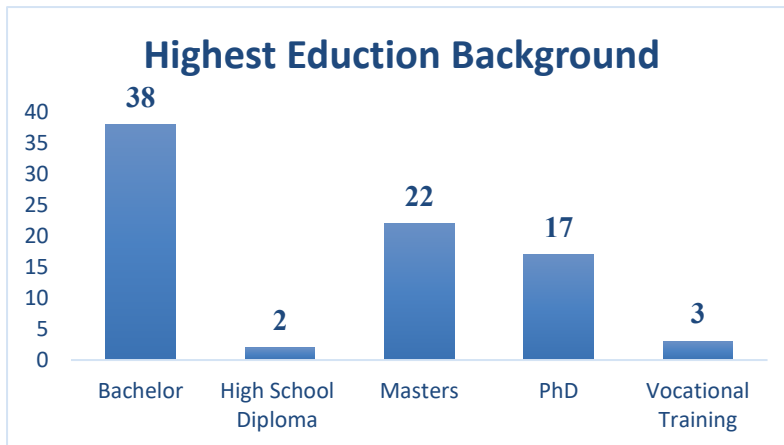


Figure 11. Educational background distribution of the participants

This diagram represents the educational background of the participants, and this provides an opportunity to delve into inherent differences in respondents' responses and examine how their educational background may have shaped these perspectives. Most of the participants, 38 of them, are bachelor's degree holders, with 22 master's degree holders, 17 PhD holders, 2 high school diploma holders and 3 individuals with vocational training.

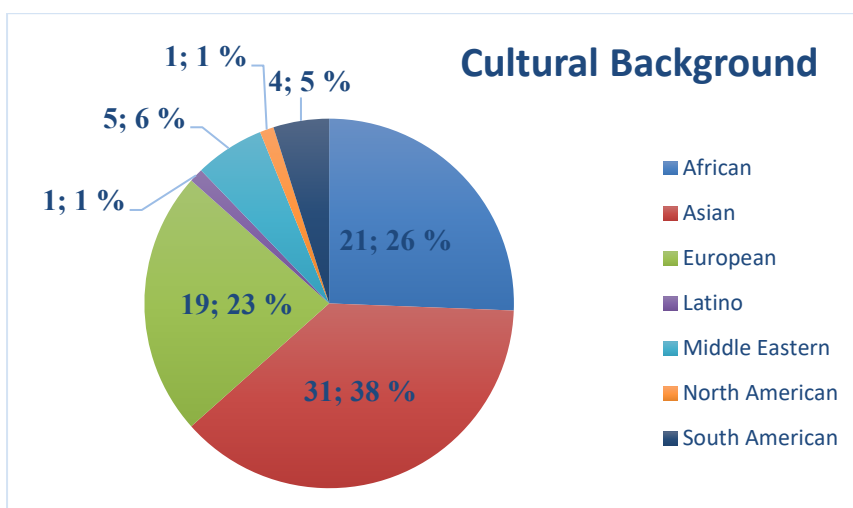


Figure 12: Cultural background distribution of the participants.

This diagram represents the diverse cultural backgrounds of the participants. The study notably includes a significant representation of 31 participants from Asian cultural backgrounds.

Additionally, individuals of African descent are well-represented, numbering 21, while Europe contributes 19 participants, with the Middle East having 5 participants. Although the Latin American and North American groups have 1 participant each, their inclusion highlights the study's global perspective. Moreover, the representation of South America, with 4 participants, further emphasises the study's diversity. Therefore, this study's global scope enables researchers to easily explore inherent cultural differences in participants' responses and perspectives.

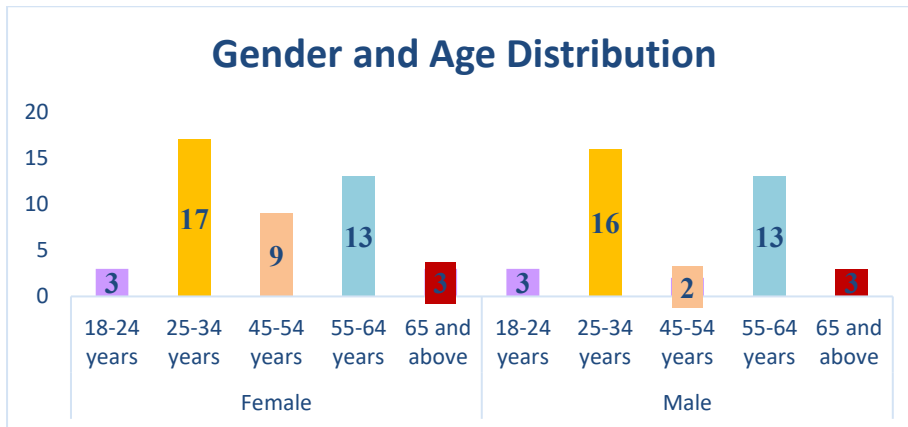


Figure 13: Gender and age distribution of the participants.

The study leverages the inherent advantages of balanced gender distribution and diverse age brackets, providing a robust dataset for exploring response variations based on age and gender demographics.

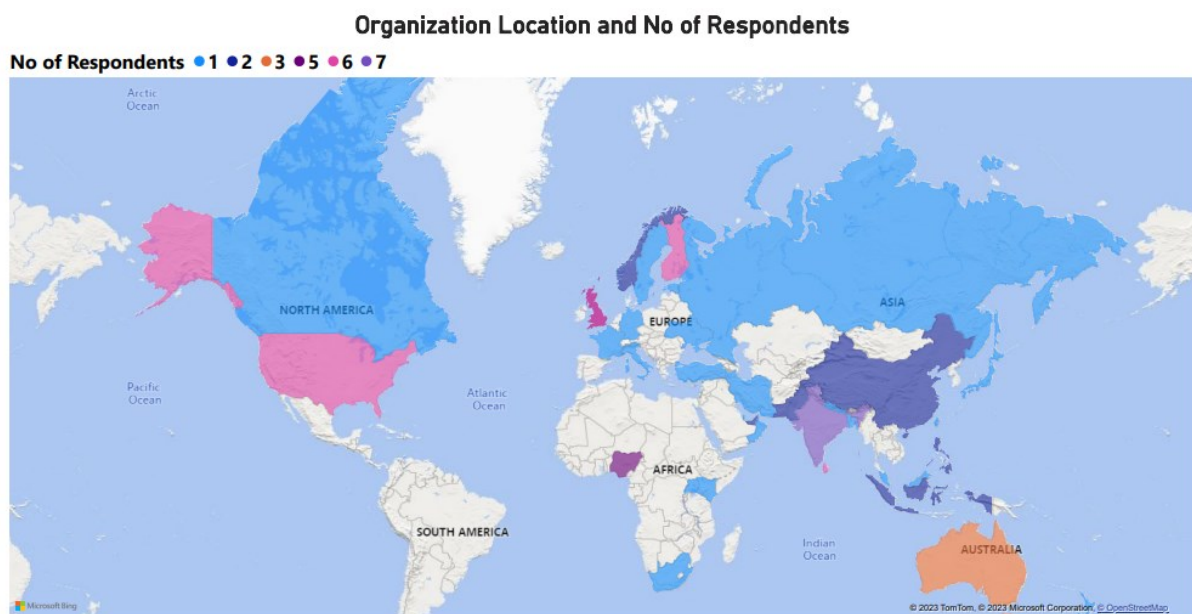


Figure 14: Workplace distribution of the participants

The study encompasses participants from various parts of the world, reflecting diverse geographical locations. Notably, the United Kingdom holds the highest representation, with 11 participants, followed by 7 participants from India. Finland and the United States of America each contributed 6 participants. The study also broadly represents nations, including Australia, Canada, China, Nigeria, and Indonesia. This global diversity allows the researcher to investigate differences in responses based on culture, region, and country. Understanding these diverse geographic trends is crucial for comprehensively interpreting the study's findings, contributing to a more nuanced global perspective on the variables under consideration.

5.3 Data Analysis

Literature has introduced several suitable methods that could be used to analyse qualitative data, which are grounded theory (Lawrence & Tar, 2013), content analysis (Hsieh & Shannon, 2005), thematic analysis (Braun & Clarke, 2012), narrative analysis (Earthy, & Cronin, 2008), phenomenological analysis (Priest, 2002), and discourse analysis (Sayago, 2015). This study utilised *thematic analysis*, a widely used method that helps to identify, analyse, and report trends (themes) in the data. Part of the reason for adopting the thematic analytical method is its flexibility, accessibility, and holistic understanding of different types of qualitative data, including focus groups, interviews, and open-ended questionnaires (Castleberry & Nolen, 2018). The thematic analytic process is iterative, as researchers are at liberty to refine and revisit themes as the analysis advances, making it a rigorous and nuanced process of data exploration (Tabassum et al., 2023).

The researcher utilised several steps in performing this thematic analysis (Campbell et al., 2021).



Figure 15. Steps involved in thematic analysis

A brief discussion of the steps is provided below.

- **Step 1 (Familiarisation with the Data):** This is about getting familiar with the data to know its content and make sense of the entire material.

- **Step 2 (Generating Initial Codes):** Systematically coding interesting data features to identify potential themes. It involves labelling and categorising relevant portions of the data.
- **Step 3 (Searching for Themes):** This entails grouping codes to form themes by patterning them in a cluster-like form, thereby helping to find connected data.
- **Step 4 (Reviewing Themes):** Here, the identified theme is checked and refined to ensure accuracy in the data representation. The theme is reviewed relative to the whole dataset and individually extracted code.
- **Step 5 (Defining and Naming Themes):** The nature and content of each theme are defined using a descriptive name, which allows the creation of concrete narration of each theme.
- **Step 6 (Writing the Report):** Here, the theme is incorporated as a coherent and insightful narration, causing the researcher to deeply explore each theme and discuss them based on their relevance to the posed research question.

5.4 Ethical Considerations

The following are the key ethical considerations that were made when this study was conducted.

- **Informed consent:** This is about seeking the consent of the participants, giving them clear insight as to the interview objective, what their participation entails and the inherent risks, and letting them understand their right to withdraw their consent voluntarily.
- **Voluntary participation:** This is to make sure the participant's participation in the interview is not by force.
- **Anonymity and confidentiality:** This ensures that the participants' identities are not disclosed, and their sensitive information shared during the interview is protected with the utmost confidentiality.
- **Privacy:** The interview is conducted in private to protect participants' personal information and confidentiality.

- **Informed about the recording:** Should the interview session be recorded, participants are informed of the reason, and their consent is requested before the recording starts with an assurance of care and confidentiality of the shared information.
- **Sensitive topics and trauma:** Discussions on traumatic experiences should be approached with the utmost sensitivity, with a provision of the right resources for mental health, if need be.
- **Respect for cultural differences:** The researcher must understand the differences in culture, respect them, and be guided against insensitivity to cultural beliefs and practices that could discomfort the participants.
- **Avoidance of harm:** The researcher must be wary of inflicting mental or emotional harm on the participants, mainly when discussing sensitive issues.
- **Debriefing:** The researcher must create chances for debriefing after the participants have participated in an interview. It helps to discuss feelings or concerns and offer additional information where needed.
- **Professional boundaries:** Professional demeanour must be assumed throughout the interview session by not getting involved in personal talk or activities that could derail the objective of the interview.
- **Inclusion and diversity:** It is essential to make the session inclusive by ensuring diverse viewpoints are entertained, and people should not be excluded because they are of different genders, ethnicities, and races, among other variables.
- **Competence:** The interview session should be handled by competent hands, mainly if it involves sensitive issues or specialised knowledge.
- **Honesty and transparency:** The objective of the interview should be evident to the participants right from the beginning. Also, the researchers' identity and potential conflict of interest must be addressed and clarified to the participants.

6 Chapter 6: Results and Discussion

This study involves interviewing 82 participants to gather a wide range of qualitative data to complete the research's set objective. Thematic analysis was conducted to extract relevant data for the objectives. A brief discussion about the results and discussion associated with the findings are provided in this chapter. This chapter has a series of recommendations denoted as r1, r2 ..., r35; these lists of recommendations are compiled together in [Chapter 7](#).

6.1 General concepts

Five major concepts were discussed during the interviews: workforce studies, gamification, data privacy and cyber security.

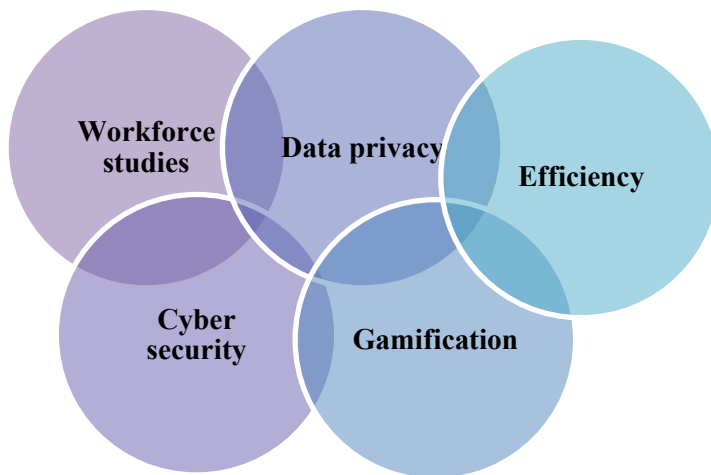


Figure 16. Concepts

A brief discussion of the understanding from the participants of the major concepts is discussed below:

Workforce Studies

Almost all the participants (98%) had basic knowledge and had participated in workforce studies conducted by an organisation. It is worth noting that some participants refer to it as a study on well-being. The study participants expressed that the main focus of workforce study is to measure different areas related to employees in an organisation. Some areas mentioned by the participants are leadership, knowledge management, well-being, career progression, racism, discrimination, diversity and inclusion, personal development, and work-life balance. The participants agreed that organisations utilise several traditional approaches such as interviews, questionnaire, and focus groups. However, most participants (95%) specified that

the questionnaire is the most widely used approach for workforce studies because it is cheaper to assemble and easier to analyse.

It is important to note that all the NGO participants specified that their management makes an effort and allocates resources to perform workforce studies as frequently as possible. However, 85% of them stated that the management is still struggling to determine precisely when the workforce studies should be conducted because there is always a problem of low participation. On the other hand, 90% of the participants from the company category specified that their management does not prioritise workforce studies and mostly does it to please stakeholders. Also, 80% of the participants from the company category feel that the management is not willing to allocate resources to perform workforce studies, and the employees are also not willing to participate as they feel that it is adding to their workload without any benefits. Some participants even mentioned that these workforce studies hinder their day-to-day tasks, affecting their overall performance.

Gamification

Only 22% of the participants had expert knowledge of gamification, whereas 49% had basic knowledge. All the participants confirmed that, as of now, they are unaware of utilising gamification strategies for workforce studies in any of the organisations. It was also worth noting that some participants think that gamification is all about the graphical representation of high-quality games. However, those with expert knowledge in gamification confirmed that gamification is about introducing gaming concepts, ideas, elements, competitiveness, motivation and other gaming concepts into non-gaming environments to achieve a specific task. Also, they stated that the gamified platform could be as simple as a question bank to move the cat in the mesh to catch the rat (nothing fancy).

80% of the participants recommended that the gamified workforce study platform be customised for each organisation as the workforce dynamics differ. Participants listed several applications of gamification that they have personally used and created, some of which are listed below.

- **Escape room game for education:** Two participants clearly explained that a transformational education system allows students to enhance their teamwork and critical thinking by engaging in the collaborative problem-solving process.

- **Knowledge training for first aid students to perform CPR:** One of the participants clearly explained that this focuses on providing a comprehensive training program for first aid students with a focus on CPR skills.
- **Company IT security policy awareness training among the employees:** Only one participant from the company sector stated that employees typically do not read the terms and conditions or the policies as they are too large and time-consuming. Therefore, the company's IT department created a gamified platform that introduced the policies.
- **Gamified psychometric assessment for recruitment:** 5 participants with less than 5 years of experience stated that gamified psychometric assessment is one of the recruitment tasks they completed to enter the private sector. They stated that it is widely used to capture the candidate's abilities and traits for decision-making.
- **Onboarding training for new employees:** 2 of the participants stated that it was used to introduce the company values, policies, and unspoken rules in the organisation to the new employees.
- **Training simulation for shooting:** 1 participant stated that it was used in training to improve the safety and tactical skills of security and law enforcement personnel.
- **Pilot training to learn the flight manual.** 1 participant stated that simulation is always used for pilot training. However, new training platforms for pilots include a gamified platform, which quickly assists the trainees in learning the complete information about the flight manual.

Data privacy

It is interesting to know that all participants know about data privacy. One participant stated, "Well, this is a digital area; even your refrigerator wants to know your deepest secrets...". However, participants (25%) who are experts in designing digital platforms stated that the initial system design should incorporate data privacy-friendly design to ensure it is safe for sensitive information storage. They also discussed the importance of data privacy by stating the issues organisations and employees will face if they neglect it. Some of the concerns discussed were:

- Security breaches can cause unauthorised access to sensitive information.

- Legal consequences are neglecting regulatory requirements.
- Identity theft
- Loss of trust in brand reputation
- Financial loss

Lastly, all the participants agreed that data privacy needs to be incorporated when introducing gamification strategies for workforce studies, as it will be unacceptable for the personal information of employees to be exposed because of negligence.

Cyber security

Not all the participants had a clear understanding of cyber security. Some of the participants (20%) even stated that for them, the term cyber security means hacking. However, the participants (35%) who are experts in the IT and security field clearly defined cyber security as a set of practices used to protect digital assets, computer systems and networks. Also, some components of cyber security discussed are information security, application security, network security, cloud security and incident response and management. The knowledgeable participants stated clearly that cyber security is also a critical aspect that must be considered when introducing gamification concepts for workforce studies.

Efficiency

Some participants (45%) discussed efficiency as a vital aspect of any platform, including prospective gamified platforms for workforce studies; they mentioned that the efficiency of a platform is about achieving its set goals optimally and effectively. One of the participants said:

“Efficiency is not about getting things done but getting them done in the way they should be done with minimum resource and on time”.

The participants also mentioned that efficiency is one essential factor that can affect the successful implementation of any platform. They further stated that efficiency drives user engagement, improves user experience and minimises resource usage. However, 5% of the participants stated that in some circumstances, the efficiency of a platform is not given high priority; for example, some highly secured systems, such as a banking application, might compromise user experience to make the system more secure. In summary, the efficiency of a

gamified platform for workforce study will depend on the platform's goal and how it achieves it with minimal resource usage without compromising user engagement and experience.

6.2 Reliability and Validity of Data Collected (Objective 1)

Below is a comprehensive discussion of the findings, including the identified themes and associated coding for objective 1.



Figure 17: Mind map of the themes and coding for objective 1

This section will delve into the specific themes that emerged from the data and the coding applied to interpret and categorise these themes. It will provide a nuanced understanding of the study's findings, shedding light on the key patterns and insights gleaned from the data analysis.

Effectiveness of gamification

According to 82% of the participants, the effectiveness of gamification is one of the key aspects to consider and validate before introducing the concept in workforce studies. The main reasons participants believe effectiveness is important are participant engagement, learning outcomes and overall success (**r29, r31, r33**). One participant defined gamification's effectiveness in workforce studies as *“the degree to which the game-based concepts could be used to measure different aspects of workforce studies”* (**r5, r35**). Some of the key components discussed by the participants under effectiveness are learning outcomes (82%, **r31**), workforce engagement (78%, **r29**), workforce motivational levels (78%, **r7**), workforce satisfaction (68%, **r33**), and behavioural effects (21%, **r16**).

Learning outcome is the component that was widely discussed among the participants. It was defined as the benefit the receiver expected to receive by introducing the gamification concept in workforce studies (**r5**). The learning outcomes discussed by the participants are mainly categorised into two types: “for employees” and “for organisations” (**r31**).

It is worth noting that most operational-level participants (80%) and consultants mainly focused on the employee rather than the organisational perspective because of their strong focus on individual experiences (**r21**). In contrast, almost all the management / leadership / supervisory level participants (95%, **r19**) focused more on the organisational perspective than the employee perspective because their primary responsibility is overall organisational goals (**r2**).

The expected learning outcomes for the employees who recommend the need for the gamification concept for workforce studies, as discussed, include the following:

- Increase trust with the management, i.e., the management is willing to make a change in the organisation for the benefit of the employees (**short-term goal, r18**).
- Their voice is regularly heard by the managerial or supervisory level (**short-term goal, r9**).

- They should be able to reflect on themselves over time. Also, assist in self-discovery **(short-term goal, r9)**.
- Increased job satisfaction **(long-term goal, r33)**.
- Increased work-life balance **(long-term goal, r33)**.

The expected learning outcomes for the organisation, as discussed, include the following:

- Establishing a good relationship between managerial and operational employees **(short-term goal, r18)**.
- Create an organisational culture that is trust-based **(short-term goal, r2)**.
- Nobody is left out in the organisation **(short-term goal, r22)**.
- Increased organisational performance **(long-term goal, r35)**.
- Increased retention of talents or human capital **(long-term goal, r35)**.

Also, the participants mentioned that workforce motivational level directly impacts workforce engagement (r7).

$$\text{workforce motivational level} \propto \text{workforce engagement}$$

A good amount of the participants (55%, r29) expressed that introducing the gamification concept in workforce studies can allow organisations to perform the studies more frequently than traditional methods because they could be introduced into weekly or monthly performance indicators (KPI) for staff (r17). They explained the benefits frequent monitoring with gamification platforms can bring. They include:

Can overcome the issue of mood swings' impact on the responses of the traditional workforce studies as the gamification platform can be used to see the trends over time from each participant.

Create a mindset that the management prioritises the employees' well-being (r14).

Due to the above-discussed benefits, the participants agreed that frequent employee participation may increase workforce satisfaction (r33). Also, one of the participants indicated

that it may be possible to measure workforce satisfaction levels using a gamification platform and identify factors that influence the satisfaction level. Some of the factors include:

- Time of the day,
- seasonal periods, and
- projects in which the employee is involved (**r9**, **r33**).

Most participants (70%, **r29**) believe it could promote healthy competition and collaboration among the workforce because real-time feedback could encourage them to put more effort into their jobs (**r30**). However, some participants (30%) discussed the possible behavioural effects of using gamification platforms for workforce study and pointed out that over-competition between the workforce can also negatively impact organisational performance because it could encourage dishonesty among the workforce (**r16**).

$$\text{over competition between workforce} \propto \frac{1}{\text{organisational performance}}$$

Some of the reasons for this negative impact were due to lack of knowledge sharing, the decline in collaborative effect between workforce, increased stress and burnout, more focus on short-term goals, possible increase in unethical behaviour, lack of innovation and creativity, and focus on individual recognition compared to team effort or team recognition (**r16**).

The participants (36%) stated that the platform's effectiveness and efficiency are different but connected terms. An effective platform does not ensure efficiency because effectiveness majorly focuses on achieving set goals, while efficiency is about achieving that goal without wasting resources, which is not always true. One of the participants pointed out that a well-designed platform means a platform that is both efficient and effective. Another participant mentioned that organisations will need to strike a balance between the efficiency and effectiveness of the platform.

Bias in data

A substantial number of participants (66%, **r24**) focused on the bias in data generated from the gamification platform for workforce studies. Some of the key types of bias discussed during the interviews are selection bias (49%, **r1**), social desirability bias (44%, **r9**), response bias (49%, **r9**), gamification experience bias (66%, **r21**), and cultural bias (61%, **r1**).

During the discussion, the participants stated that organisations cannot make workforce studies mandatory. Therefore, it is possible that voluntary participation can cause selection bias in the organisation's entire workforce (**r24**). For example, one of the participants mentioned that the organisation it represents has more than 3000 employees working worldwide, and some regional offices may not even adopt the gamification platform, which can create an imbalance in participation (**r24**). To encourage people to participate in the gamification platform-based workforce studies, the participants (22%, **r22**) with expert knowledge in gamification mentioned that it is important to introduce award-based approaches such as extra points and level unlock to motivate the workforce to use the gamified platform.

Also, some of the other participants pointed out that the traditional workforce study approaches cause social desirability bias as the participants provide responses that are pleasing to the management or leadership of the organisation in order to be on the favourable side (**r9**). However, they mentioned that the gamification approach can minimise the socially desirable bias as it does not explicitly ask the participants to state their opinions (**r9**).

All the participants agreed that gamification is a new concept for workforce studies, and user inputs may cause systematic patterns of inaccurate responses from the platform (**r5**). Moreover, one participant noted that the gamification platform reward system could cause the participants to focus more on rushing to complete a specific task to earn the rewards rather than providing accurate information (**r7**).

Most older participants (80%) raised concerns about gamification experience bias. They noted that older people lack knowledge of gamification, whereas younger people have more experience and knowledge (**r21**). Therefore, they feared that the younger generation would adopt a gamified workforce study platform better than them (**r21**).

The participants highlighted the possibility of the employees focusing on the game elements and neglecting the actual purpose of the workforce study, which could lead to biased data (**r5**). Also, one of the gamification experts pointed out that people with high IT literacy skills can exploit loopholes in the system and predict the actions that can bring a high satisfaction level (**r28**).

Some participants noted that culture could also cause bias because understanding differs concerning the organisation's culture (**r1**). Also, they mentioned that there could be bias in the design of the gamified platform itself, for example, neglecting the preferences of minority

groups (r8). One of the participants reminded the researcher that the following should be considered by anyone who wants to build a gamified platform:

“Truly, inclusive design of the platform should recognise the cultural bias within the organisation and try to incorporate their values into the design to make them feel that they belong”.

One participant stated that bias in data can affect user engagement negatively because some users will feel that whatever they do will not be good enough. When there is low user engagement, the system does not have sufficient data to optimise and perform its duties efficiently.

Longitudinal analysis

91% of the participants believe that the introduction of the gamified platform could make the performance of longitudinal analysis possible; this is the analysis of data that was generated for an extensive period of time with certain intervals, which can allow for the examination of trends, patterns, and changes over time (r17). One of them responded poetically stated:

“Long term patience and monitoring, the data acquired becomes the torchlight that unveils the mysteries hidden in the fabric of time”.

Some participants specifically discussed that a gamified approach could allow the organisation to study the performance of the employees or specific teams over some period using the learning curve effect (r6). They also pointed out that the learning curve effect can assist the management or supervisor in knowing the initial challenges faced by the employees or the teams (r19). Most of the participants (85%) pointed out that traditional workforce studies do not consider the mood of the participants. However, they believed that the gamified platform could assess the workforce's behavioural change, which can minimise the margin of error caused by mood swings (r16). The participants with data analysis (20%) experience noted that continuous generation of the data by employees can increase the reliability and validity of the data because it measures the consistency of responses over time (r24). Also, they mentioned that the longitudinal analysis could allow the management to compare the data at different time frames to find meaningful patterns (r17). Additionally, they believed that outliers could also be identified, which directly impacted the reliability and validity of the workforce studies.

outliers \propto validity AND reliability

Two participants pointed out that a platform that utilises longitudinal analysis has a high probability of adapting and optimising strategies to align with the ever-changing workforce dynamics. Hence, the platform's efficiency is improved because it only needs to rely on the latest data trends for decision-making and not on old, outdated data, e.g., from employees no longer in the organisation. Furthermore, decisions are made faster, improving user experience and platform engagement.

Workforce dynamics

The participants believe that workforce dynamics is an ever-changing factor in any organisation, which focuses on the relationship, interactions, and behaviours within the workforce and also between the workforce and the management of the organisation (r2). One of the participants stated that.

“In the fluid dance of organisational progress, workforce dynamics behave like an ever-changing rhythm adapting to the transformative beats of employee diversity and inclusion”.

Some of the key aspects of workforce dynamics discussed by the participants are cultural compatibility (66%, r8), workforce training and development (94%, r21), adaptability (98%, r6), and organisational goals (95%, r2).

The participants believe successful workforce dynamics is about embracing different cultures and creating a workforce environment compatible with various multicultural aspects (r8). Also, they pointed out that when an organisation prioritises cultural compatibility, it enhances teamwork and communication between employees and, in turn, overall employee satisfaction (r8). Therefore, they recommended that the gamified platform design incorporate the organisation's multicultural aspects. One of the participants even went on to say that the platform colour or theme should be changeable according to the user's preference. Additionally, another participant mentioned that not only the theme but also the user experience and possible interaction should consider the multicultural aspects of the users (r8, r15).

Most participants agreed that not everybody is familiar with gamification, especially in workforce studies. Hence, they emphasised that continuous learning is required. They stated that the users should be provided continuous training to ensure they are well-informed about the platform's usage and purpose. One of the participants explained that it was necessary to emphasize during the training that the collective growth of the workforce can also impact individuals directly and/or indirectly (r21).

The participants discussed the adaptability of the gamified platform for workforce studies with respect to workforce (73%) and organisation (82%). They made an important note that Most of the operational level participants from the company's category (82%) and government category (89%) explicitly stated that it was important for the organisation to first adopt this new concept, then the workforce will adopt it automatically because the supportive environment can encourage the workforce to embrace the concept more naturally (r2). However, participants from the NGOs (80%) and health-related organisations (75%) stated that it is essential to focus on workforce adaptability instead of organisational adaptability because the agility and resilience of individual employees drive the overall adaptability of the organisation. Overall, it is possible to state that the relationship is reciprocal and a two-way street. One of the participants stated that.

“...responsive workforce complements an organisation's ability to navigate changes”.

Also, many NGO participants (75%) mentioned that the workforce dynamics must align with the organisational strategic goals to achieve sustainable success. Therefore, they recommended that the gamified platform adapts to changes in the organisation's strategic goals to make valuable data for decision-making (r2).

Some participants (26%) stated that workforce dynamics are vital to any platform's efficiency. The platform algorithms should work with the current workforce dynamics and not with older ones that no longer represent how the organisation works. Utilising the current workforce dynamics will make the system more efficient as it only needs to process the current workforce data.

Measurement

Participants discussed two major measurement factors: metrics (17%) and workforce experience and feedback (77%).

The metrics information was discussed by participants with a wide range of knowledge in data analysis. There were 3 key metrics discussed and recommended for consideration, which include reliability (13%), data consistency (10%), and validity (12%). Some of the recommended metrics specified concerning reliability are test-retest and inter-eater reliability; they are used to track the consistency of responses across several inspectors (r17). Besides, consistency indices and variance analysis are the two key metrics introduced for data consistency; they are mainly used in analysing the variability in the responses over different

segmentations (r24). Likewise, content and construct validity are the key metrics introduced for validity; they focus on measuring the platform's effectiveness for the key goal.

However, most of the participants did share information regarding the workforce experience and feedback, and the information collected can be widely categorised into three: perceptions (71%, r33), integration and interface design (49%, r7) and user suggestions (51%, r9). Many participants introduced sentiment analysis and perception scores as a good measurement approach that could be utilised to evaluate employee perceptions concerning the work environment because they provide insights into emotional attitudes (r33). The participants also believed that the system design and integration are vital for the success and adaptation of the platform by both the general workforce and managerial level of participants (r7).

Some of the participants stated that system usability and integration effectiveness are some of the ways that could be used to measure how well the system is working concerning the pre-defined workflow. Participants who had previous experience designing and developing systems (25%, r13) specified that there is a need to consider user suggestions to create a user-friendly and easy-to-use system (r9). Also, they added that it is vital to use the existing approaches, algorithms and platforms and not reinvent the wheel when building a gamification platform (r10). One of the participants expressed the importance of user feedback or suggestions as.:

“user feedback fuels the heartbeat of any system, which encourages constant refinement...”

Another participant stated that *“user feedback makes the system developers focus more on the precision and purpose”*.

Also, the participants with gamification platforms stated that it is always good to leverage the existing ones. One participant mentioned that accurate measurements will allow the platform to adapt suitable strategies to improve efficiency. Another participant mentioned that accurate measurement could assist in data-driven decision-making, an adaptation of user preferences and the identification of successful strategies that could result in more improved user experience, improving the gamified platform's efficiency.

Limitations of gamification

85% of the participants believed that gamification could be an effective approach to performing workforce studies. However, many participants specified a wide range of possible limitations

of gamification that should be considered, such as technical glitches (43%, **r27**), accessibility concerns (62%, **r14**), resource constraints (71%, **r13**) and generalisation of real-world scenarios (37%, **r16**). They also suggested some mitigation strategies to overcome them. A brief discussion of the limitations of the gamification discussed during the interviews is listed below:

The gamification platforms can face technical issues such as compatibility issues, server failure, and bugs (**r27**). It is also important to note that one of the participants with knowledge of creating gamification platforms stated that the possibility of compatibility issues is negligible (**r14**). The reason for this perception is that most of the gamification platforms are browser-based, and it is believed that most of the devices have browsers that can run the system. Another user specified that technical glitches should be prioritised as they could negatively impact the user experience and reduce user engagement (**r27**).

Some participants believed it is impossible to ensure equal access to the gamified platform because of the diverse age groups, technical literacy, and cultural backgrounds of the organisation where they work (**r14**). They further noted the possibility of inclusivity being compromised by this unequal participation.

Another issue is the limitations of available resources in the organisation to implement and maintain a gamified platform (**r13**). Many participants, mostly from companies (80%, **r13**), mentioned that the management might not be willing to allocate resources for workforce study-related aspects or maintain such platforms.

Ethical consideration develops when gamification strategies influence the behaviour of the participant. The participants raised concerns about the possibility of the reward system encouraging dishonesty among the workforce (**r7**).

Gamified scenarios might generalise or oversimplify real-work situations, which can mislead the participants into providing wrong responses (**r16**).

Two participants pointed out that regularly studying the limitations of gamification could assist the organisation in refining its strategies to maintain the platform's efficiency. Some strategies discussed were avoiding counter-productive elements, optimising user experience and enhancing motivational design.

Psychological Aspects

Many participants (93%) also discussed the psychological aspects of the gamification approach and strategies. They mentioned that gamified platforms would require more mental effort (cognitive load) from the participants to process the tasks or information provided compared to the traditional workforce study approaches (r5). Participants specified that it is always good to have a minimal design for the platform (r7). Also, almost all the healthcare specialists discussed the possible cognitive biases in decision-making from different people (r5). They stated that people have different capacities of judgment when it comes to pattern matching, which can influence the decision-making process and may affect the reliability and validity of the data generated from the gamified platform. One of the participants summarised it as follows.

“People interpret information through the lens of their experience, knowledge, and perceptions. So, everybody has their own lens...”

Participants (49%) who have had experience with existing applications that utilise gamification strategies stated that it can evoke various emotional responses for the tasks provided: frustration, joy, or competition (r7). However, participants maintained that positive emotions could enhance motivation and engagement. Also, all the healthcare participants pointed out that gamification can impact the workforce's well-being, affecting stress levels and job satisfaction. It is important to note that one of the participants pointed out that there is also a possibility of increasing the number of gaming addicts in society because the introduction and utilisation of gamification strategies could fuel them negatively (r7).

Some of the participants (22%) stated that leveraging psychological insights from the gamified platform, such as understanding motivational drivers, incorporating behavioural economics, and enhancing intrinsic motivation, could improve user engagement and motivation, which could contribute to the overall efficiency of the platform because the platform will have enough current data to perform efficiently.

Data Validation

Data validation is one of the trending topics among the participants (85%), and they discussed several aspects that could be involved in ensuring the validity of the data gathered from gamified platforms. Many participants mentioned cross-validation (74%) with internal and external data sources (r24). Many NGO participants (80%) stated that they have internal data

from previous workforce studies conducted to validate the data generated from the gamification (r24). However, a few participants also pointed out that it is important to keep the expectation open by expecting shock responses. One of the participants stated that:

“Well, I agree gamification for workforce studies is new, but new does not mean wrong, but do not be shocked it can be correct. I want to remind you that the old approach does not mean it is all correct... I will recommend keeping your mind open and ready to investigate before concluding anything”.

Additionally, some of the participants with a wide range of experience with data analysis experience (20%) and conducting workforce studies (20%, r24) mentioned that several external sources, such as publicly available data and industry benchmarks, could be used for cross-validation (r17). Also, one of the participants stated that it is good to perform cross-validation with external data sources. However, it should not be the only information used for decision-making.

Moreover, some participants (63%) also recommended creating an expert panel of internal and external experts to validate and review the collected data from the gamified data (r24). They stated that their domain knowledge and insights could be valuable to ensure the relevance and accuracy of the data. The participants with data analysis experience mentioned that statistical validation should be performed to check for outliers and consistency. Also, they mentioned that it is vital to ensure that the gathered data are reliable by cross-verification with multiple sources; this is known as triangulation of data. One of the participants mentioned the following.

“Triangulation in data is similar to checking direction in three different GPS apps. Well, why? I strongly believe when it comes to information, it is always good to have several backup satellites for the real truth”.

Some participants (31%) discussed the importance of validated data to the efficiency of the gamified platform. The participant stated that if the data is validated, the platform could be customised for workforce studies in a shorter time than when unvalidated data is used.

Comparative analysis

74% of the participants agreed that comparative analysis effectively confirms the data's validity and reliability. Therefore, they recommended that the data generated from the gamified platform be verified with the outcomes from the traditional workforce studies. It is important

to note that almost all the participants (95%) stated that they did not expect gamification platforms to replace traditional methods of workforce studies; instead, they expect it will improve the quality of data received by an organisation by providing hidden insights (r1). Also, participants mentioned that benchmarking against industrial standards (43%) can cause continuous improvement and innovation, which could enhance the validity and reliability of the data gathered from the gamified platform (r35). Additionally, they mentioned that ensuring the validity and reliability of the data gathered from the gamified platform could increase the chances of organisations adopting it. One of the participants summarised it as follows:

“.... nobody wants to be the first to try out the invention, but they are ready to follow others...”

Lastly, one of the participants from the university mentioned that academic organisations are always willing to try out new inventions.

42% of the participants stated that comparative analysis is central to keeping the platform competitive by adapting to best practices contributing to overall platform efficiency. They explained that best practices could assist the platform in optimising user experience, incorporating technical advancement, and benchmarking against industrial standards.

6.3 Challenges and Barriers (Objective 2)

Below is a comprehensive discussion of the findings, including the identified themes and associated coding for objective 2.

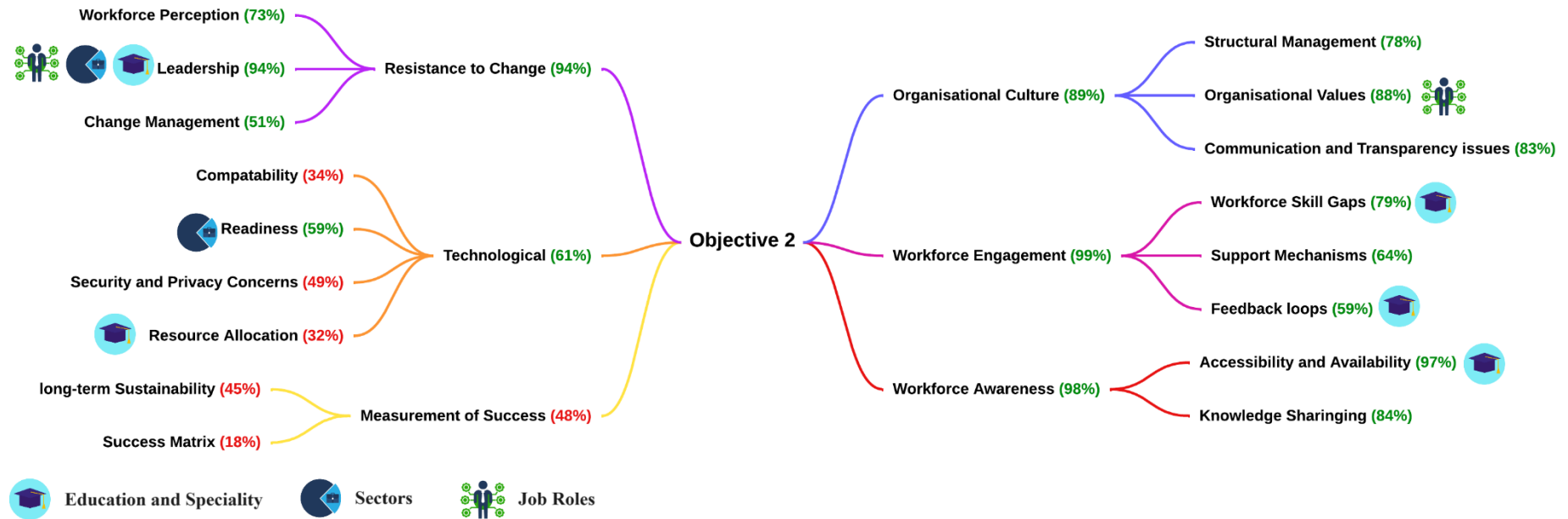


Figure 18: Mind map of the themes and coding for objective 2

Organisational culture

Almost all the participants (89%) discussed various aspects of organisational culture. It was clearly defined as shared beliefs, values, practices, and behaviours of individuals within an organisation and how they work and interact together (r11). One of the participants pointed out the difficulty of having a concrete statement that clearly explains the exact culture of the organisation. Another participant mentioned that organisational culture is usually unwritten and implicit. Also, another participant specified that the organisation could evolve over time as the organisation's culture is primarily dependent on the workforce. A participant from Finland stated that organisational culture in Finland is evolving as organisations are becoming more diverse. There are three broader elements of organisational culture, as discussed by the participants, which were structural management (78%), organisational values (88%), and communication and transparency issues (83%).

Many of the participants mentioned that organisational structure is very vital for the formation of organisational culture. For example, if the hierarchy structure of the management is flatter, then the autonomy and collaboration between the employees are more prominent.

$$\text{heirarchy of management structure} \propto \frac{1}{\text{collaboration and autonomy}}$$

The participants also discussed the organisation's decision-making process that impacts the organisational culture. Many participants stated that if an organisation practices a decentralized decision-making process, then the organisation could be responsive to change. However, if the decision-making process is centralised, change could be challenging. Many of the participants (70%) from the company's sector mentioned that the adoption of a gamified platform for workforce study is the responsibility of the management, and the general workforce cannot be involved in it because adapting any innovative tools requires strategic decisions and the management is mostly not influenced by the workforce requirements. On the other hand, many of the participants (85%) from NGOs stated that adopting a gamified platform for workforce study is the responsibility of both management and the workforce (it is more like a joint effort) because the management always includes their workforce in the decision-making process.

Many participants (75%) with managerial job roles specified that organisational values reveal the fundamental principles and beliefs that can assist in decision-making and forming the organisational culture. Adopting the workforce study mainly depends on the organisational

values as no regulatory framework mandates the need for workforce studies. Also, some participants (30%) mentioned that the mission and vision of the organisation are essential when it comes to adopting any new concepts. From the overall findings from the interview, it was clear that participants from NGOs (95%) and academics (93%) believe that adoption of a gamified platform in their workplace will not be challenging since both sectors believe they do not really have fierce competition and are more willing to try new things out than other sectors, contrariwise, participants (80%) from company's sector believe that it will be challenging as it is not the company's first priority (r11).

One of the participants mentioned that communication is one of the aspects that reflects an organisation's culture. For example, if the communication channel is one way from management to the operational level, then those companies will have difficulty changing. However, if the organisation has two-way communication between management and operations, then those organisations can quickly adapt to changes. One of the participants stated the importance of organisational culture and the role it plays in innovation.

“Organisational culture is a heartbeat of success where innovations thrive.”

Some participants (52%) discussed that a positive and supportive organisational culture would promote user engagement on the gamified platform, which means the platform will have sufficient current data to perform its task efficiently.

Workforce Engagement

Workforce engagement is one of the key aspects 99% of the participants discussed; it refers to the level of commitment and enthusiasm that the workforce has towards their work and colleagues (r5). An example discussed by a participant is that if the organisation fosters a culture of open communication and recognition for employee achievement, the employee feels a sense of connection to the organisation's goals, which can increase engagement. Most of the participants (80%) stated that the management of their organisation does not even know their workforce very well because they do not try to find a way to connect with them and give them a sense of belongingness. Also, it was stated by many of the participants (65%) that employees may refuse to accept the gamified platform for workforce studies because they could view it as a distraction or even an additional workload. Some of the broad areas discussed include workforce skill gaps (19%), support mechanisms (64%), and feedback loops (59%, r34).

Some of the participants mentioned that there is a skill gap in many organisations to achieve the organisational strategic goals, and the management is not aware of it. The participants noted that one of the severe skill gaps that could impact the successful adoption of gamified platforms is the low familiarity and comfort with utilising technologies, especially gamified platforms. Many older participants (85%) said that although they know how to use computers and mobile phones, they do not enjoy them much. One of the participants stated:

“I still wonder why this new generation does not enjoy reading books; I mean real physical books.”

Also, the participants (80%) stated during the discussion that the management does not know what support resources employees require to complete their tasks effectively. Some participants (30%) stated that the COVID-19 pandemic led to an increase in the hybrid way of working, consequently making the management unaware of all the problems the workforce faces. Hence, when workers are already working in this condition, introducing gamified platforms without adequate support when they need help will affect the workforce, leading to frustration and disengagement from the platform (r5).

Again, the participant mentioned that feedback from employees to management is an excellent way to improve employee engagement. Therefore, they recommended that the gamified platform collect user feedback and make necessary changes to ensure continuous engagement from the workforce (r5).

Notably, one of the participants pointed out that workforce studies are one of the main ways to let the management know about the workforce dynamics. However, workforce studies are expensive and time-consuming, so organisations do not perform them frequently. Some participants (35%) who specialise in conducting workforce studies specified that the frequency of conducting workforce studies in the organisation has increased after the COVID-19 pandemic. However, it was unanimously agreed that the required frequency to conduct workforce studies differs from organisation to organisation and from time to time, even within the same organisation.

Some participants (46%) mentioned that high levels of workforce engagement contribute to a significant increase in the efficiency of the gamified platform because as motivated employees participate in the workforce studies, the platforms get enriched with data for timely decision-making.

Workforce awareness

Workforce awareness is another key concept that needs to be considered when introducing the gamified platform. Most of the participants asked a similar question.

“Do you think people would understand the concept of having a gamified platform for workforce studies?”

Almost all participants (98%) mentioned that even now, the responses to the workforce studies conducted within their organisation do not have a high response rate, which indicates that many of the participants are not even aware of the benefit of participating in workforce studies (r5). They further asserted that the implementation will succeed if the workforce understands the benefit of a gamified platform for workforce study; otherwise, there will still be challenges.

One of the participants with experience in building gamified platforms for education mentioned that the accessibility and availability of workforce studies could be increased by introducing gamification strategies. However, if the workforce does not understand the benefit of this concept, then they will be sceptical or resistant to adopting the initiative (r23). Also, the participants discussed the possibility of frequent participation in workforce studies via gamification, and they recommended that for it to be adopted, it must integrate seamlessly into the existing workflows of the organisation (r5). Another participant mentioned that even when the training programs are available, some workers do not leverage them as they feel it is not mandatory (r32).

Also, the participants mentioned that if the gamified platform could encourage a collaborative environment where individuals can learn from each other, it could be beneficial to convince the employees to adopt the platform. One of the memorable quotes by a participant about the success of the implementation of gamified platforms is this:

“...employee awareness is a master key to success, so if a new system can grab hold of it, then success is assured...”

Some participants (31%) pointed out that improved workforce awareness about the benefits of gamified platforms for future workforce studies could increase high adoption rates, making the platform more effective because more data is available for decision-making that will drive desired outcomes and behaviours.

Resistance to change

Resistance to change is a widely discussed topic among 94% of the participants. Many participants (73%) mentioned that the workforce may resist gamified platforms due to natural resistance to change or unwillingness to try something new. One of the participants mentioned that.

“...not everybody enjoys the feeling of triumphing by trying something new, unknown or unfamiliar.”

Some participants mentioned that most people resist change because they are concerned about disturbing their workflow or learning curve. Moreover, some participants mentioned that employees may question the value or relevance of gamified platforms for workforce studies that disturb their daily tasks; if the employees' perceived benefits do not align with their understanding, they may resist change (r5).

Participants with expert knowledge in gamification mentioned that developing a gamified platform will require significant resources, and not all organisations may be willing to invest their resources into it. Many of the participants from the company sector (77%) mentioned that their organisation focuses on profit rather than employee well-being. Therefore, they believed that profit-making organisations might not be interested in adopting gamified platforms for workforce studies (r5).

Crucially, two participants pointed out that the success of implementing a gamified platform depends on the engagement level of the leadership or the endorsement level for the adoption. They pointed out that not many organisations utilise gamified concepts; therefore, the workforce may not be aware of it. Therefore, they stated that introducing a gamified platform for workforce studies can succeed if all the mandatory change management strategies are followed; failure to do so will create resistance to change.

Some participants (30%) discussed that those who are usually resistant to change will be more willing to try a new system if it is efficiently designed, i.e. it does not take much time to use.

Technological

61% of the participants from large organisations stated that they utilise diverse technological ecosystems comprising different operating systems, devices, and software. One of the interesting quotes stated during the interview was:

“...technology compatibility is all about ensuring that the innovation works harmoniously with past, present, and future systems.”

Therefore, they stated that having a gamified platform compatible with a wide range of technologies could be challenging. They also mentioned that some of the regional offices are in rural areas where the workforce has limited internet capacity and computers. Consequently, some workforce cannot actively participate in any gamified workforce studies.

59% of the participants also mentioned the importance of measuring the readiness of the workforce to adopt a gamified platform because of widely varying levels of digital literacy that could directly impact participants. One of the participants from academics stated that the level of digital literacy in the workforce is different, so the training level also should be different. For example, if an individual has medium technical knowledge and the basic training is given by mistake, it could demotivate him from adopting the platform.

Many participants (49%) mentioned an increase in concerns with respect to security and privacy due to frequent news regarding data breaches. They also mentioned that drawing a clear line on which data the gamified platform will collect and which data it should not collect nor store for future processing is essential.

Participants with knowledge of implementing gamified platforms clearly stated that the organisations would require significant resources and time to design or customise the gamified platform for their work environment. Therefore, they stated that competing priorities and limited resources could directly challenge the organisation to implement the gamified platform (r2) successfully. One of the participants stated the following.

“...allocate resources widely by prioritising the path to success.”

Some participants (29%) pointed out that having responsive technical support could ensure a seamless user experience, reducing friction, which increases user engagement and saves time, which in turn increases system efficiency.

Measurement of success

Some participants (48%) agreed that it is challenging to determine the criteria or factors that could be utilised to measure the success of implementing gamified platforms for workforce studies. One of the participants mentioned that employee participation on the platform could be used as an immediate measure to know that the implementation is going on a successful

path. However, the participant mentioned that it is not sufficient to determine the ultimate success (r6).

Some participants mentioned that it is challenging to maintain an interest in the same game design for a long time because employees may lose enthusiasm if they feel more familiar with it. One of the participants stated.

“Familiarity could make an individual lose interest over time.”

One of the participants mentioned that ensuring clear success metrics of the platform could also assist in measuring its efficiency because it will help ascertain if the platform aligns with the organisation's strategic objectives, especially those related to time and resource usage.

6.4 Cyber-security and Privacy Concerns (Objective 3)

Below is a comprehensive discussion of the findings, including the identified themes and associated coding for objective 3.

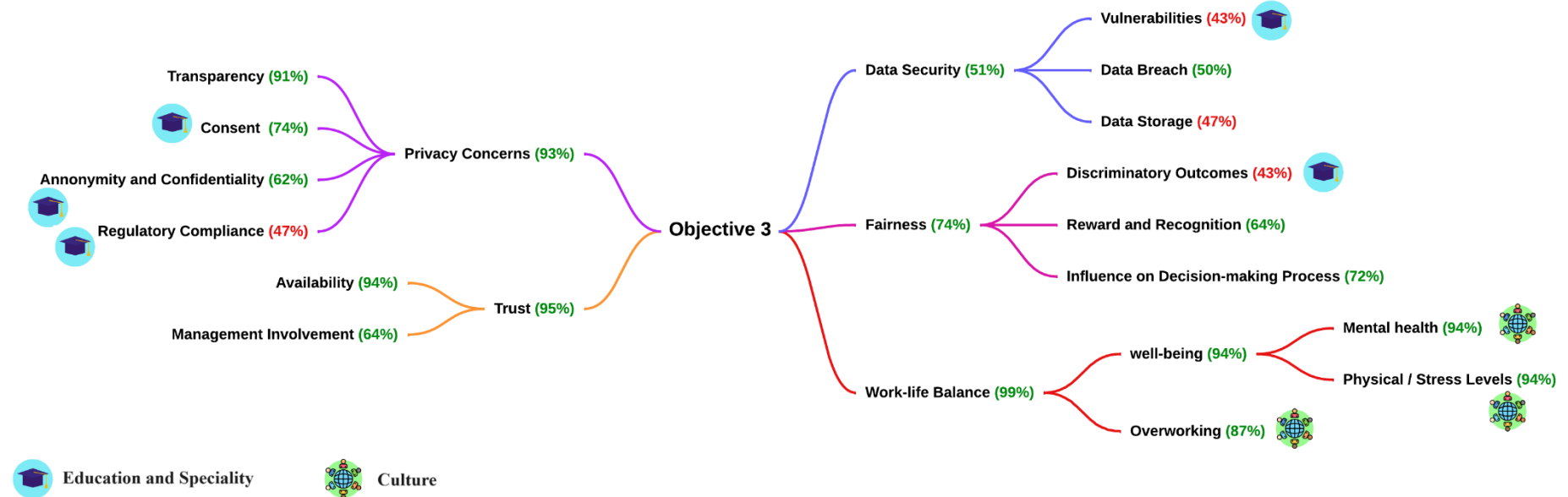


Figure 19: Mind map of the themes and coding for objective 3

Data security

51% of the participants expressed their concerns regarding the data security aspect of the gamified platform for workforce studies, which were vulnerability (43%), data breach (50%) and data storage (47%).

One of the participants stated that there is no perfect system without any vulnerability. If a system does not have a vulnerability as of now, that means the vulnerability has not yet been discovered. Some participants (20%) mentioned that even though the system is well designed, it is still possible to have vulnerability because the user is considered the weakest link of the system. One of the responses said:

“Users have their own brains and minds, so they tend to do what they like depending on their mood. So, who can predict them?”

One of the participants mentioned that introducing a new system should be done after careful consideration as it can create a vulnerability point for attackers to other secured systems in the organisation’s intranet.

One of the participants, a system developer, mentioned that systems are made up of thousands and thousands of codes, and there could be logical errors that are still undiscovered even after using the system for several years. For example, a Heartbleed bug was identified in the widely used OpenSSL cryptographic software library only after 2 years. Moreover, some participants (25%) recommended encryptions and access controls as ways to increase data security. However, they also pointed out that increasing security would negatively impact the system's efficiency.

$$Security\ of\ the\ system \propto \frac{1}{Efficiency\ of\ the\ system}$$

Most of the participants stated that systems that collect and store data related to the workforce should be mindful of data breaches. Hence, they mentioned that the gamified platform should not collect data that could help identify individuals in an organisation. However, some of the participants from smaller organisations partially disagreed with this statement, saying that even behaviours could be used to identify a particular person in an organisation because they have a small group workforce. One of the participants stated that the only way to minimise the risk of a data breach is to collect as minimal information as possible, and thus said:

“You cannot lose your key if you do not have a door...”

The participants agreed that data storage is a challenging aspect of a gamified platform or any other platform for workforce studies because it could differ according to the size and location of the organisation. However, they recommended that it is essential to classify the level of the data that the platform intends to store and then implement security for them accordingly (**r1**, **r3**, **r4**).

The participants with IT and security experience mentioned that ensuring robust data security on the platform promotes user confidence and engagement. However, an overly restrictive platform will negatively affect the user experience, leading to them spending more time doing what they want.

Fairness

74% of the participants believe fairness is fundamental in implementing a gamified platform for workforce studies because it promotes an inclusive and positive work environment, increases employee performance and motivation, encourages team collaboration, and improves employee satisfaction and retention. However, one of the participants mentioned that ensuring fairness is very challenging.

“Fairness is like the rarest gem in the jewellery world”.

Three major challenges to fairness were widely discussed in the interviews: discriminatory outcomes (43%), reward and recognition (64%), and influence on the decision-making process (72%).

Participants with system development experience pointed out that it is possible to have undiscovered discriminatory outcomes from the gamified platform because of the developer's platform design or algorithm. One of the participants mentioned that organisations have a wide range of workforce from different backgrounds; therefore, the design could discriminate against certain minority groups. Also, another participant said that the algorithm implemented to recognise the user behaviour in the gamified platform could favour certain groups of people (**r6**).

Some participants mentioned that gamified platforms are mainly designed with recognition and reward systems to motivate the workforce. Therefore, it is possible that these reward systems could not recognise some of the users' efforts, which can demotivate them from using the

platform. Also, it is possible that the matrix used in the gamified platform can overly emphasise certain metrics that could directly influence the decision-making process. One of the participants stated:

“... when favouritism becomes a compass, the true north of purpose will fade away..”

Work-life balance

Almost all the participants (99%) stated that work-life balance is a trending topic, especially after the COVID-19 pandemic, as many people started working from home (remote or hybrid work style). One of the participants mentioned that many people are not even aware that they are not living a balanced life. Participants from developing countries did not comment much about work-life balance; they believe that the work environment is very competitive, and if an individual refuses to give extra effort, they will not be able to get benefits such as bonuses, promotions, and recognition. One participant said the following:

“In some parts of Asia, youth are taught to focus on career ambitions before embracing their families”.

The participants noted that the supervisors or managers are not aware that their employees are burning out due to overworking and cannot complete the assigned daily tasks (r37). Hence, they believe that introducing them to gamified platforms can exacerbate burnout.

Most participants mentioned that physical well-being is at stake because many employees live sedentary lives and spend extended periods sitting in one position (r38). One of the participants stated that currently, many individuals are suffering from musculoskeletal problems due to a sedentary lifestyle. Therefore, the participant thinks introducing a gamified platform may add to the existing problem rather than solve it.

A few participants mentioned that mental health issues are also one of the significant issues that the workforce faces all around the world. They mentioned that the current high-pressure environment could increase their stress level, and introducing a gamification platform could also increase their stress level. However, other participants believe introducing a gamified platform could reduce their stress levels as the individuals could relax their minds when playing (r39).

Two participants pointed out that if the platform could promote a healthy work-life balance, the users would engage with the platform consistently, which means the platform would have enough current data to perform efficiently.

Privacy concerns

Almost all the participants (93%) discussed the privacy concerns that could be caused by using a gamified platform for workforce studies. One of the critical areas discussed was the concern of what data is collected, how it is collected, what will be done with it, and who can see it. Most participants expressed deep concern about transparency, as many platforms already lack clarity concerning data (r4). One of the participants said.

“Everything has ears, including walls...”

Participants mentioned that unless clear information regarding the data that the gamified platform is handling is given to the workforce, many people will not adopt the platform; this also means receiving explicit consent for all the data collected from the participants. Also, the experts in IT and security also pointed out the importance of proper system and code documentation and version control to identify the data the platform is handling (r12). The participants with several years of experience in building gamified platforms specified that it is evident that the behavioural data collected at every point is different; therefore, the users should receive explicit consent every time new data is collected (r4).

However, one of the IT and security participants pointed out that the organisational workforce is not always sure if their IP addresses are monitored. Also, another participant stated that most of the users will be using the organisation's laptops or at least connected to the intranet either on-premises or remotely via VPN. Therefore, the possibility of getting exposed or identified while using the gamified platform is high. Here are some of the questions asked:

“Are we sure the platform will be unable to identify and recognise us? How is anonymity even possible? I am sure it is only in theory that it is possible.”

Additionally, one of the participants also mentioned that some people do not have sufficient knowledge about personal data and are naive; hence, providing them with the system can cause privacy concerns (r25).

It means that participants are concerned about anonymity as they believe that achieving anonymity could be challenging. Moreover, one of the IT and security specialists raised a point

that a gamified platform should be able to handle sensitive or highly classified data from an individual (r4). Therefore, the participant mentioned that it is essential that the gamified platform has required security features enabled to protect user data. Furthermore, they mentioned that data is a sensitive matter, and several legal regulations, such as HIPAA GDPR, provide relevant frameworks on how the data should be handled and what data should be collected (r3, r4, r26). Lastly, one of the participants stated that it is vital to consider the data-related regulations when designing the platform to minimise future regulatory compliance issues.

Some participants (49%) mentioned that if the gamified platform could address the users' privacy concerns, then user engagement would improve, which means that the platform would have enough current data to perform its task efficiently.

Trust

Almost all the participants (95%) agreed that building trust is essential for successfully implementing gamified platforms. They mentioned that the employee needs to feel confident that the platform is accessible and secured. Also, they mentioned that full recognition from the management or leadership could increase the trust in the gamified platform among the employees (r20). Participants from the government mentioned that if the platform has been used in other industries, the gamified platform is considered trustworthy (r46).

Some of the participants explicitly stated that retention of the participants is critical. If the platform is not available for usage, then the trust in the platform from the users will gradually reduce (r47, r48). One participant said:

“Trust is a heartbeat of every reliable connection”.

Some participants (69%) mentioned that establishing long-term user trust by maintaining consistent user engagement with the platform will lead to the platform always having fresh data to perform its duties efficiently.

7 Chapter 7: Conclusion and Recommendations

7.1 Conclusion

In this study, the researcher examined the possibility of introducing gamification strategies for workforce studies to mitigate the current challenges when using traditional methods such as interviews, questionnaire, observation and focus groups. The research also studies the potential cyber security and privacy issues the gamified platform could face that could affect its efficiency. This study gathered qualitative data from 82 professionals to achieve the three main objectives.

Objective 1 of this study focuses on the validity and reliability of data collected from a gamified platform for future workforce studies. All the participants agreed that workforce dynamics are very fluid and ever-changing. Therefore, they recommended that workforce studies are essential and should be conducted frequently to capture these behavioural and mood changes. 66% of the participants expressed their concern about the potential bias in data, such as selection bias, social desirability bias, response bias, gamification experience bias and culture bias; therefore, they proposed that an inclusive design should be adopted.

Also, 93% of the participants pointed out that the reliability of the data could be impacted by psychological factors such as cognitive behaviour and emotional well-being of the workforce. Additionally, 85% of the participants recommended that the involvement of an expert panel, cross-validation, statistical validation, and triangulation of data from multiple sources could enhance data validity. The participants recommended comparative analysis, longitudinal analysis, and various measurement metrics to ensure reliable data. The participants also emphasised the importance of training the workforce to adopt the platform and incorporating the multicultural aspect of the organisation.

Almost all the participants agreed that data's reliability and validity significantly impact a gamified platform's efficiency, as accurate and trustworthy data enhance the platform's ability to derive detailed, timely and meaningful insights from the organisation's workforce environment.

Objective 2 of this study focuses on the challenges of implementing a gamified platform for future workforce studies. From the analysis, 6 major challenges addressed by the participants include organisational culture (89%), workforce engagement (99%), workforce awareness

(98%), resistance to change (94%), technology (61%) and measurement of success (48%). Organisational issues include the decision-making process and communication mechanism. Moreover, the participants pointed out the need to hasten the decision process by having a decentralised decision-making process. Workforce engagement and awareness challenges include the organisation not having adequate information about its workforce.

One way to get meaningful information about the workforce and understand the organisational dynamics is through workforce studies; however, they are expensive and are not done frequently. The participants highlighted that the introduction of gamification can lead to the frequent conduct of this type of study and will provide management with quicker information on the state of the workforce. Also, another challenge was the low response rate; the participants believed that introducing gamification concepts could help improve this. Other issues include resistance to change, which the participant believed could be solved by the management playing a pivotal role in first endorsing and adopting the platform. Some of the technical issues pointed out were compatibility, readiness, and resource allocation. The measurement of success challenges includes the inability to determine a criterion for measuring success and ways to make users not lose interest.

The participants mentioned that potential challenges such as workforce engagement, resistance to change, and the need for technological literacy could pose obstacles to the seamless adoption and utilisation of the platform. The low adoption rate means the platform will not have adequate data to operate efficiently.

Objective 3 of this study focuses on identifying cyber security and privacy concerns that impact the efficiency of the gamified platform for workforce studies. The study identified that 93% of the participants were concerned about 4 main privacy issues: transparency, consent, anonymity and regulatory compliance. However, the solution to mitigate them includes the provision of clear information about what data is collected and how it is handled; also, explicit consent needs to be requested frequently, especially as data is changing frequently as well as the application of regulation frameworks such as HIPAA, GDPR and so on to protect sensitive data. For data security, participants were more concerned about data breaches, possible vulnerabilities, and data storage.

The participants also expressed concern that the introduced gamified platform could be a potential gateway for unauthorised access to other data and systems connected to the organisation's intranet. However, the solution to mitigate against this includes the use of

encryption, appropriate access control mechanisms and collecting minimal data, especially data that could not be used to identify people. Additionally, the study notes that 95% of the participants believe that trust is an essential factor to ensure the success of the implementation of gamified platforms. They stated that the gamified platform needs to receive full support from the management to achieve a high level of engagement from the workforce. Other concerns discussed include the possibility of the system not recognising user efforts because of its algorithm, the discrimination against minority groups, and over-emphasis on specific metrics that will favour a particular group of people.

The participants mentioned that robust security measures are essential for a gamified platform; however, an overly restrictive security framework could negatively impact efficiency by reducing user engagement due to its restrictive security measures. Therefore, they recommended that there is a need for a balance between security implementation and efficiency to ensure a successful operation of the gamified platform.

7.2 Limitations of the study

The following are some of the limitations identified by this study, along with the reference to the suggested future works (f1, f2, f3 and f4) to overcome them.

- The study mainly focuses on participants from various organisational levels. The number of representations of operational-level employees is relatively low compared to managerial-level employees, which may have skewed the results (**f1**).
- This study relied on qualitative data with no quantitative data collected, which limited the ability to establish statistical significance and trends (**f2**).
- This study did not include a prototype design of any gamified platform for workforce studies, which prevented a direct evaluation of user experience and expectations (**f3**).
- Even though this study tries to include participants from different cultures, some cultural perspectives are under-represented (**f4**).

7.3 Future Works

The following is the list of suggested future works for this study:

- **Expanded participant demographics (f1):** Future research should incorporate more operational-level employees to ensure diverse perspectives within the workforce.
- **Quantitative data gathering (f2):** Future research should incorporate quantitative data gathering using questionnaire to establish trends and statistical significance that could offer a more comprehensive analysis.
- **Implementation assessment (f3):** The prototype of the gamified platform should be designed, and the experience and expectations should be assessed with potential users.
- **Cross-cultural perspectives (f4):** Even though the study's participants span a wide range of participants from different cultures, some of the cultures require more participants to capture diverse perceptions.

7.4 Recommendations

The recommendations from the participants are mainly categorised into four major stages, which are crucial for implementing any gamified platform for workforce studies in an organisation. The overview of the recommendations flow can be seen in the figure below.

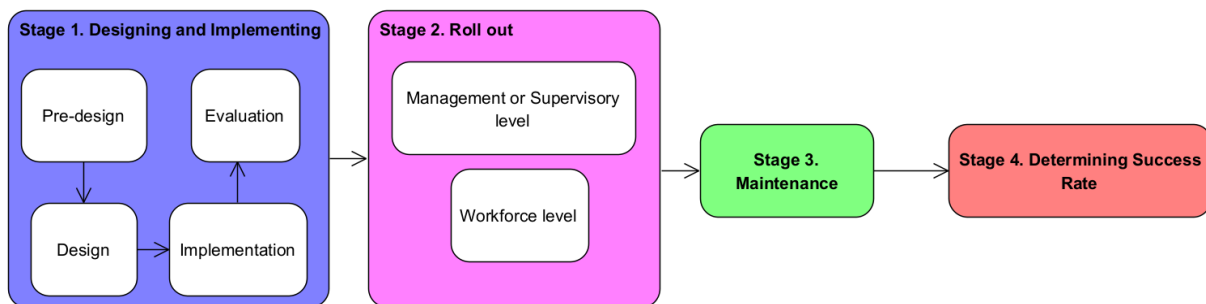


Figure 20. The overview of the flow of the recommendations

Stage 1: Designing and Implementing

This stage consists of 4 main sub-stages: pre-design, design, implementation and evaluation. A brief discussion of each of the stages is provided below.

Pre-design: It is essential to consider the factors that could affect the entire system design even before designing the platform. Some of the proposed key factors that were recommended during the interview are:

- Study the demographics, literacy, and awareness levels of the organisation's workforce. Also, assess the diversity of the workforce in the organisation (r1).

- Identify and study the organisation's strategic goals, culture, mission, and vision (**r2**).
- Identify what types of data are expected to be gathered from the platform and classify them according to their priority level (**r3**).
- All applied regulatory requirements should be identified and assessed (**r4**).

Design: Several concepts need to be considered when performing the actual design of the gamified platform. However, the concepts for the design must be derived from the factors analysed in the pre-design phase.

- Ensure that the gamified platform adapts user-centred design (UCD) to enhance the user experience (**r5**).
- Select a suitable game mechanism for workforce dynamics (**r6**).
- Implement suitable intrinsic and extrinsic motivational factors within the platform to ensure long-term engagements (**r7**).
- The users should be able to customise the interface to ensure it caters for diversity within the workforce (**r8**).
- The platform should gather feedback to understand user experience and expectations (**r9**).

Implementation: Some key concepts were recommended by the participants with experience in developing gamification platforms, which need to be done during the implementation phase.

- Utilise existing gamification logic and algorithm and avoid reinventing the wheel on already tested methods (**r10**).
- Ensure that user authentication and authorisation are implemented (**r11**).
- Version control should be maintained to have clear information on the code changes done (**r12**).
- Proper documentation should be created that is useful for various categories of actors, such as the organisation's developers, users, and leadership (**r13**).
- Implement a browser-based gamified platform to ensure that the platform can be accessed with minimum technical capacity (**r14**).

Evaluation: This is the final phase where the developed system needs to be double-checked before it goes live for usage by the workforce.

- Perform user testing to study the platform's user experience (**r15**).
- Perform behavioural analysis of the platform to ensure that the outcome of the platform does not discriminate against the user type (**r16**).
- Study the performance impact of the platform against different categories of users (**r17**).

Stage 2: Roll Out

This is where the developed gamified platform for workforce studies is going live to the target audience within the organisation. Participants in the interview noted that the success of the implementation depends on the organisation's management and workforce. Therefore, the recommendations for both groups of people are provided below:

Table 4. Recommendation for roll-out

Group of people in the organisation	Recommendations
Management or supervisory level	<ul style="list-style-type: none"> • Get their full trust and support by following the approaches: <ul style="list-style-type: none"> ○ Educate the management or supervisory level employees to learn the benefits of a gamified platform for workforce studies. It is essential to address that the platform will not replace the existing methods but will support them by providing a different dimension of the workforce status (r18). ○ Also, explain that the gamified platform could assist the management in knowing when to perform the traditional workforce studies to get maximum benefit from the analysis (r19).
Workforce Level	<ul style="list-style-type: none"> • Demonstrate the support of the management to the workforce to gain their initial trust (r20). • Perform workforce training according to their IT level and gamification literacy. It is recommended to group the literacy level of the workforce into three categories: introductory, intermediate, and advanced (r21).

	<ul style="list-style-type: none"> • Appoint ambassadors or representatives of the gamified platform for each department or region to promote active participation (r22). • Educate the workforce on the benefit of active participation on the gamified platform (r23).
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Stage 3: Maintenance

This is a phase where the reliability and validity of the data of the gamified platform are to be ensured.

- Perform regular data audits to identify if the platform is collecting or accessing data that are not pre-planned (r24).
- Ensure that the users are not providing personal information that could make them identifiable during the analysis (r25).
- Perform regular assessments of the data governance framework to ensure it captures all the active governing regulations (r26).
- Perform periodic security validation and check to identify vulnerabilities not yet discovered (r27).
- Ensure the technologies used in developing the gamified platform are up to date (r28).

Stage 4: Determining Success Rate

The following is the success assessment matrix for the gamified platform derived from the participants' recommendations.

Table 5. Success Assessment Matrix

Area	Key metrics	Evaluation Criteria
User Engagement	Active participation (r29)	Number of registered users and active users in the platform.
	Time spent on the platform (r30)	The average time the user spent on the platform.
	Knowledge retention about the platform (r31)	How familiar are the users with performing the same task?

Learning skills and development	Completion rates (r32)	Number of people who completed the training programs related to the platform.
User satisfaction and feedback	User Surveys and feedback (r33)	Positive and negative feedback from the users.
	Rating and recommendation (r34)	Overall rating of the platform.
Performance	Achievement of strategic goals (r35)	Indicators showing the workforce's progress could assist in reporting against the strategic goals.

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