# What Rasch Model Tells About Intergenerational Ambidextrous Behavior Among Knowledge Workers

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**Abstract.** Knowledge workers are viewed as a critical resource for knowledge-based businesses in the knowledge era. Knowledge workers are those that are continually seeking innovative answers to problems. As part of human resource management, knowledge management makes it easier to produce, manage, and distribute the appropriate information to the right people in the right place at the right time. Knowledge sharing is the most crucial aspect of knowledge management. As older generations retire and subsequent generations take on leadership roles, the transfer of tacit knowledge is essential to the organization's sustainability. This study looks at the disparities in intergenerational knowledge workers' ambidextrous behaviors in the educational area. According to the Rasch Model, the hypothesis is statistically insignificant. It indicates no substantial variation in ambidextrous behavior among knowledge workers, in the educational area, based on age differences or intergenerational aspects. It implies that both generations of employees are naturally ambidextrous with little distinction.

## **1** Introduction

Knowledge workers are a crucial resource for knowledge-based enterprises in the knowledge era. Employees constantly looking for creative solutions to issues are classified as knowledge workers [1]. As a result, knowledge-based enterprises must prioritize team competency development [2]. To attain a knowledgebased organization, one of the organization's tactics is to develop competencies at three levels: individual, group, and organizational [3, 4]. As part of human resource management, knowledge management facilitates developing, managing, and delivering the correct information to the right people in the right place at the right time. The most essential component of Knowledge Management is knowledge sharing [4–7].

Knowledge has evolved as a vital aspect in retaining competitiveness in more complex, worldwide, and fastpaced commercial organizations, particularly in the service industry [8]. As one of the most essential components of the service sector, higher education significantly depends on their knowledge to provide effective educational processes. Furthermore, it is strongly reliant on its teachers and employees' expertise, experience, and ethics, who offer their knowledge as inputs to the service processes [9–12].

Researchers and scholars mentioned that 99% of work is knowledge-based activities. Knowledge-based activities are inside the mind of every person in the organization. It is known as tacit knowledge or intangible assets such as hands-on skills, experiences, best practices, and know-how [3, 4, 13, 14]. Another kind of knowledge is explicit knowledge or procedural knowledge. As a tangible asset, explicit knowledge is contained in documents and other forms of storage. It is also embedded in facilities, processes, systems, products, and services [3, 4, 13, 14].

As a significant organizational asset, knowledge can be considered knowledge capabilities [8]. Knowledge capabilities describe a specific combination of a company's tangible and intangible knowledge assets, talents, and activities that enable competitive advantage [8]. There are three types of knowledge capabilities: 1. exploitation, which allows for the (re)use of existing knowledge; 2. exploration, which focuses on the search/assimilation of new knowledge; and 3. ambidextrous, which allows for the adaptation of its knowledge base to changing market demands. It is a dynamic application of exploitation and exploration capabilities [8].

Ambidexterity is one of the individual learningbased activities. Employee ambidexterity develops when employees engage in explorative and exploitative behavior [15]. Exploring involves looking for alternatives, discovering, producing, experimenting with new possibilities, finishing tasks, and learning from mistakes. While selecting, implementing, enhancing, and refining established certainties. In a nutshell, explorative means trying something new. At the same time, exploitation is based on one's experience, formulating a strategy, and putting the plan into action [16, 17].

As a knowledge-based activity, ambidexterity transforms people's abilities, knowledge, talents, ideas,

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and commitments into valuable assets. Organizational techniques, tactics, formal knowledge, human skills, and experiences have become valuable assets. Organizational knowledge is an example of this. Knowledge-based activities promote the interchange of data, information, knowledge, and wisdom within a firm and the creation of value [18].

Numerous generations are actively working in today's labor market: Generation X, Generation Y, and Generation Z are steadily entering the labor market. Many scholars agree that age differences influence organizational performance [19]. Nowadays, most generation X workers are nearing retirement, while generation Y is the dominating workforce in enterprises. Generation Y will soon be the dominant workforce [20, 21].

Knowledge management is the transmission of explicit task-related abilities and tacit and experiential knowledge, encompassing appropriate organizational behaviors and holistic decision-making skills (i.e., cultural, organizational politics, and good leadership styles). The transfer of tacit knowledge is critical to organizational survival as older generations retire and newer generations take over leadership roles [22].

Previous studies have been conducted to explain intergenerational knowledge transfer. Sprinkle examined organizations' value methods for enabling learning and knowledge transfer in intergenerational learning [22]. According to the researchers, improved learning will occur in organizations that facilitate targeted socialization. It responds to new preferences and trends in development programs while leveraging multiple approaches such as informal/individualized initiatives (such as on-the-job education, mentorship programs) and embraces various types of volunteering activities [19, 22].

Another study examined an opportunity and problem for organizations to ensure that all employees, regardless of age or experience, have access to the company's specialized expertise [23]. Her study found that each generation has independent expert, practical, social, and metacognitive knowledge. They exchange different categories of information at other times. Her findings also showed that intergenerational learning should be considered bi-directional. It has several foci of mutual knowledge exchange occurring at different times. Instructors should modify their teaching approaches to employees' phase-specific demands. They also should discover strategies to comprehensively map older and younger employees' specialized knowledge to support intergenerational learning [24]. A study conducted by Irawan [25] found some barriers influenced by age differences and which obstacles are only present in senior and younger persons. The study conceptually contributes to the Information Systems (IS) community's understanding of intergenerational innovation [25]. A similar study conducted a review and analysis of intergenerational diversity. The researcher found that intergenerational knowledge transfer practices and methods for developing learning agility in all generations through internal mobility and the creation of communities of practice and learning [26].

There are still very few studies that examine ambidextrous behavior among knowledge workers using Rasch Model Analysis. The Rasch Model analysis will provide deeper analysis based on items of each dimension, specifically the Wright Map, to enrich the previous literature on intergenerational knowledge workers.

### 1.1 Objectives

The research aims to examine the differences between the intergenerational ambidextrous behaviors of knowledge workers in the educational field. As known, education is a part of the service industry that relies heavily on knowledge to get sustained.

# 2 Literature Review

## 2.1 Ambidexterity

Researchers and scholars mentioned that 99% of work is knowledge-based activities. Knowledge-based activities are inside the mind of every person in the organization. It is known as tacit knowledge or intangible assets such as hands-on skills, experiences, best practices, and know-how. Another kind of knowledge is explicit knowledge or procedural knowledge. As a tangible asset, direct knowledge is contained in documents and other forms of storage. It is embedded in facilities, processes, systems, products, and services [3, 6, 13, 27].

Knowledge capabilities can be considered a critical organizational asset [8]. Knowledge capabilities are a specific combination of a company's tangible and intangible knowledge assets, talents, and activities that allow for a competitive advantage [8]. There are three sorts of knowledge capabilities: exploitation, which provides for the (re)use of current knowledge; exploration, which focuses on the search/assimilation of new knowledge; and ambidextrous, which allows for the adaption of its knowledge base to changing market demands. It is a dynamic use of exploitation and exploration skills [8].

Ambidexterity refers to a condition in which exploration and exploitation efforts are completed with one another avoidance [15, 16, 28]. According to some experts, such elements can exist in the organizational, team, or individual contexts. For example, exploration is concerned with search, discovery, and risk-taking, whereas exploitation, is concerned with execution, performance, refinement, selection, implementation, and risk avoidance [15, 16, 28]. In other words, explorative behavior refers to activities that enable a team to search for, experiment with, and develop new knowledge. In contrast, exploitative behavior refers to activities that allow a team to refine, recombine, and implement existing [16, 17].

Ambidexterity at the individual level means that both exploration and exploitation will produce synergisms. According to an empirical study, ambidexterity has a favourable impact on organizational agility and effectiveness. According to the scholar, ambidexterity is a method of leveraging knowledge generation and knowledge accumulation from exploration and exploitation processes to optimize organizational effectiveness and efficiency [28–32].

#### 2.2 Intergenerational Knowledge Workers

Knowledge workers are a valuable resource for knowledge-based enterprises in the knowledge era. The educational sector is one of the knowledge-based enterprises. Employees who are constantly looking for innovative solutions to issues are known as knowledge workers [1]. In addition, they also have abilities, knowledge, talents, ideas, and commitments that are considered valuable organizational assets. Therefore, organizational techniques, tactics, formal learning, human skills, and experiences have become valuable assets [18].

A generation is a group of people with different beliefs, values, and attitudes. Thus, it impacts all aspects of the organization, such as human resources management [33, 34]. Karl Mannheim was a pioneer in the conceptualization of the term generation. He defined a generation as a group of individuals of similar ages. Therefore, they have similar experiences and historical and social events and share similar thoughts. Hence, it is essential to manage a diverse workforce to obtain the organization's goals, including the transfer of knowledge [23, 33, 34]. Due to the complex concept of generation, the birth year is a simplification to define and identify a generation. It implies that if someone has grown up with a different history, they might have different ways of thinking, even from the same place. In the academic and empirical studies, the generation concept refers to defining characteristics [18-20] [35]-38].

Intergenerational diversity in the workplace implies that most young workers show a strong desire to learn. Although they want to achieve a certain level of professional autonomy, most late-career workers want to continue working [33]. Over time, generation X knowledge workers are in the later stages of their careers. They show less confidence, lose their motivation to achieve operational tasks, and display a high level of anxiety about their successors within their organization. They look for ways to be valuable by transferring their wealth of knowledge gained through the years to the new generation [23, 26, 39]. While a specific element of intergenerational interactions lies in the potential to transmit knowledge that one generation has developed under its location in chronological order, the successful transfer of that knowledge across generations cannot be taken for granted. Studies show that the intergenerational transfer of knowledge is not systematic enough or that there is no transfer. Furthermore, the perceptions of generations involved in the transfer of tacit knowledge are not consistent about what deserves to be retained, transferred, and reused by the next generation [23, 26, 33, 40, 41].

As mentioned previously, Generation Y occupies three-quarters of the global workforce. They are entering the force alongside the older generations. Generation X grew up in dual worker families. The characteristics of generation X is they are self-reliant, fun-loving, and independent [18, 19, 37, 38].

Generation Y is the digital generation because they were raised with cell phones and computer games and are familiar with instant communication and social networking. They are optimistic, realistic, globally aware, and inclusive by nature. Millennials accept diversity and different types of families [18-20], [33], [36-38]. They are civic-minded and prone to volunteerism. They are results oriented. They are concerned with career options, the balance of work and non-work lives. They have personal entrepreneurial effort, independence, and creativity. At work, they are computer literate and want a fun environment. They are moving from job to job to improve their careers. They also demand fulfilling work and life-long learning [18-20], [33], [36-38]. They have personal responsibility and the need for feedback. They tend to change jobs frequently and are quickly diminished by their dissatisfaction with entry-level jobs. Millennials are collaborative and work well within the modern empowered workplace as long as there are enough challenges and opportunities to keep them interested [18–20], [33], [35–38]. This study wants to explain the ambidextrous behaviour of knowledge of workers in the educational field using the Rasch Model analysis. After a thorough literature review, the researchers came up with the hypotheses

**Hypothesis**: There is a significant difference in ambidextrous behavior among intergenerational knowledge workers.

# 3 Methods

The research instrument was developed based on literature reviews and research reviews. The questions used as a measure of ambidexterity were adapted from [29-31], [42], consisting of 9 indicators. Both dimensions, exploration and exploitation, such as knowledge creation, knowledge sharing, gathering information, making observations, anticipating change, looking for sources information to gain knowledge, learn from experience, learn from mistakes, share knowledge, build networks, update knowledge are adopted from the work of [43, 44]. The questionnaire items (table 1) were examined using Rasch Model Analysis with WINSTEPS Version 5.2.1.0. The Rash Model is also used to run the validity and reliability tests on research instruments and analyze research hypotheses. Furthermore, Rasch Model Analysis can assist in reducing the number of biased responses on self-report questionnaires [45-47].

Table 1. The Research Items

Explorative Behaviors		Explorative and Exploitative		Exploitative Behaviors	
C1	I collect	S1	I share my	U1	I study
	informati		knowledge		continuou
	on to be		and		sly to
	able to		expertise to		develop
	understan		help others		personal
	d the		complete		knowledg
	problem.		their tasks.		e.

C2	I use data and facts to get new informati on.	S2	I chose to work together on campus.	U2	I learn from mistakes to renew my knowledg e.
C3	I make observatio ns to gain new knowledg e.	S3	I work together to find the most appropriate solution.	U3	I work together to develop my knowledg e.
C4	I am looking for new informati on to be able to innovate.	S4	I share my knowledge and expertise with others.	U4	I enhance my special knowledg e.
C5	I gain new knowledg e by anticipati ng change.	S5	I put my knowledge into practice.	U5	I improve the ability for more optimal work results.
C6	I asked the experts to get the right knowledg e.	S6	I build a network with experts to be able to exchange information	U6	I work together to renew the way things work.
C7	I am looking for the most appropriat e solution to solve the problem.	S7	I document my knowledge so that it is easy for others to use.	U7	I share experienc es to renew informatio n.
C8	I look for various sources of informati on to gain knowledg e.	S8	I rate new ideas that are proven and tested.	U8	I look for various sources of informatio n to renew my knowledg e.
С9	I learn from experienc e to gain knowledg e.	S9	I prepare the information in a ready- to-use state.	U9	I recycle past experienc es to renew knowledg e.
C1 0	I learn from mistakes to gain new knowledg e.	S1 0	I do benchmarki ng.	U1 0	I asked the expert to renew the knowledg e.

The reliability (table 2) of the research instrument indicates that all responses are excellent (0.93). It implies that the respondents understood the questionnaire items. The research instrument items are also excellent (0.98). The instruments have a strong Cronbach alpha (0.92). It implies good correlations between the items and the respondents' responses [45–47].

Table 2. Reliability and Validity Test Results

Research Variables	Alpha Cronba ch	Item Reliabili ty	Person Reliabili ty	Item Validi ty
Ambidexter ity	0.92	0.98	0.93	30 items – accept ed

Source: Primary Data, 2021

## **4 Data Collection**

The study was carried out in Greater Jakarta, Indonesia, in 2021. The research respondents are 150 knowledge workers in the educational field located in Tangerang Selatan, Indonesia. After the data were collected, 108 questionnaires could be examined further. The knowledge workers comprise 64% of generation X and 36% of generation Y. The educational level of the knowledge workers is 68% of bachelor's degree graduates, 29% of master's degree graduates, and 3% of diploma graduates. They are 81% female and 19%, male.

## **5** Results and Discussion

#### 5.1 The Wright Map





Wright Maps (person-item maps) are a revolutionary approach for visualizing exceedingly complex rating scales and test outcomes [45, 46]. Wright Maps show both individuals and objects on the unidimensional logit scale used in Rasch measurement [45, 46].

The Wright Map (figure 1) shows that 45% of knowledge workers have ambidextrous behavior since the logit values are higher than the mean measure of 2.11 logit. It infers that these knowledge workers tend to have ambidextrous behavior more often than the rest knowledge workers who have lower logit values.

#### 5.2 DIF Test (Differential Item Functioning)

The results of the DIF Test (Differential Item Functioning) test in table 3 explain three ambidextrous behaviors that are different based on generation differences. These are: gaining new information to innovate (C5), anticipating change (C6), and sharing knowledge to help others in completing their assignments (S2). Those three items have probability values less than 0.05 (5%). Therefore, based on those items, there are significantly different responses between gen Y and gen X.

Ite ms	Probabil ity (logit)	Ite ms	Probabil ity (logit)	Ite ms	Probabil ity (logit)
C1	0.7961	S1	0.8935	U1	1.0
C2	1.0	S2	0.0022	U2	0.7832
C3	0.8674	S3	0.1097	U3	0.3859
C4	0.8976	S4	0.0789	U4	0.6195
C5	0.0414	S5	0.1660	U5	0.5622
C6	0.0299	S6	0.1824	U6	0.7141
C7	0.1548	S7	0.4355	U7	0.1826
C8	0.8051	S8	0.4833	U8	0.5627
C9	0.5032	S9	0.9412	U9	0.5919
C10	0.6093	S10	0.6566	U10	0.2496

Specifically, gen Y knowledge workers gain new information to innovate more frequently. They obtain further information to anticipate change more often. Furthermore, gen X knowledge workers regularly share knowledge to help others complete their assignments than gen Y. The table 4 below shows the differences.

Knowledge Management	Mean Mea	asure
Behavior	Gen X	Gen Y
Gaining new knowledge to	2.91 logit	3.05
innovate (C5)		logit
Gaining new knowledge to	2.91 logit	2.44
anticipate change (C6)		logit
Sharing knowledge to help	3.10 logit	2.69
others (S2)	_	logit
Mean in total	2,11 logit	

Table 4. Gen X and Gen Y

Table 4 shows the differences between intergenerational ambidextrous behaviour. The results support previous research about millennials. They are collaborative and work well within the modern empowered workplace as long as there are enough challenges and opportunities to keep them interested [18–20], [33], [35–38].

#### 5.3 Validation

Table 5 shows a difference between gen X and gen Y in their ambidextrous behavior. According to the Rasch Model Analysis, gen X is higher in ambidextrous behavior (2.21 logit > 2.11 logit). On the contrary, gen Y is lower in ambidextrous behavior (1.92 logit < 2.11 logit).

Code	Innovative Behavior			
Mean all knowledge	2.11 logit			
workers				
Gen X	2.21 logit			
Gen Y	1.92 logit			
Probability Value				
0.257				

The test results above show that the hypothesis is statically declined. Since the significant value is 0.257 > 0.05, there is no significant difference in the ambidextrous behavior among knowledge workers in the educational field based on generational differences. It means that both generations of workers are ambidextrous in nature. Both enjoy learning new things for a variety of reasons. Generation Y knows new things to find fresh revolutionary breakthroughs. In contrast, Generation X learns new things to anticipate changes and stay current with technology. Even though Generation X wants to aid colleagues by sharing expertise, they both enjoy sharing knowledge with little distinction.

Even though the difference is not statistically significant, Rasch Model Analysis revealed intergenerational differences in knowledge management behavior. This result shows both intergenerational knowledge are collaborative and can work well. Generation Y knows how to discover new innovations. Generation X, on the other hand, learns new things in order to anticipate changes and stay current with technology. They appreciate reusing prior experiences and cooperating on the creation of new knowledge. Both generations are open to learn new things from one another. They also use their knowledge to better understand a situation and make decisions. Based on the research results, it is feasible to create a community of practice in which intergenerational knowledge workers can share tacit knowledge. A collaborative project is another technique to foster intergenerational teamwork. It has the potential to facilitate intergenerational learning.

## 6 Conclusion

Knowledge workers are seen as a critical resource for knowledge-based businesses in the knowledge era. Knowledge workers are those who are constantly looking for innovative solutions to problems. As a result, knowledge-based businesses must make team competency development a top priority. One of the tactics used to achieve a knowledge-based organization is to develop competencies at three levels: individual, group, and organizational. As part of human resource management, knowledge management makes it easier to create, manage, and deliver the correct information to the right people in the right place at the right time. Therefore, knowledge sharing is the most essential aspect of Knowledge Management.

Knowledge management entails appropriate organizational behaviors and holistic decision-making

capabilities and the transmission of explicit task-related abilities and tacit and experiential knowledge (i.e., cultural, organizational politics, and good leadership styles). As older generations retire and newer generations take over leadership roles, the transfer of tacit knowledge is critical to the organization's survival. This study looks into the disparities in knowledge workers' ambidextrous behaviors in the educational field. As is well known, education is a service industry that is primarily reliant on knowledge to stay sustained.

According to the Rasch Model, the hypothesis is statistically rejected, indicating no substantial variation in ambidextrous behavior among knowledge workers in the educational field based on age differences. It implies that both generations of workers are naturally ambidextrous. For several reasons, they both like learning new things. First, generation Y learns new things to discover new revolutionary breakthroughs. In contrast, Generation X knows new things to stay current with technology and anticipate changes. Even though Generation X wants to help others by sharing their experience, they both like exchanging information. Finally, both are willing to refresh their prior knowledge with little distinction.

There are still some limitations to the study. It could be beneficial to include more study respondents to validate the significance level of hypothesis testing. Retesting the research instrument in other service industries, such as the hospitality industry, is also recommended. More organizational characteristics, such as organizational culture, leadership, and innovative team behaviour, should also be included.

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