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Exploring the Viability of the Ranked Discrepancy Model by Comparing the Weighted Total Index Approach and the Borich Model: A Case of Learning Needs Assessment of Career Guidance Teachers

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Abstract: The ranked discrepancy model (RDM) is a relatively novel needs assessment approach and is optimized for addressing ordinal and non-normally distributed data. This study aimed to explore the viability of the RDM by comparing the results obtained from it with those obtained using two other long-standing needs assessment models, and to prioritize the learning needs of secondary school career guidance teachers in South Korea using the RDM as an initial effort to improve the pre-service and in-service educational programs of teachers. Data were collected from 75 career guidance teachers by using a survey questionnaire. The results from the RDM, the weighted total index (WTI) approach, and the Borich model demonstrated a great deal of consistency in terms of the rankings of career guidance teachers' learning needs. This implies that the RDM is a useful quantitative method for needs assessment in cases involving ordinal items, cross-sectional data, or non-normally distributed data. This study also revealed that "providing and utilizing occupational information" is the biggest shortfall among the job tasks required of secondary school career guidance teachers, compared to its importance. Uncertainty about the future might make it more difficult for career guidance teachers to provide students with the appropriate occupational guidance.



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Keywords: needs assessment models; ranked discrepancy model (RDM); teacher education; teacher professional development; career guidance teachers

1. Introduction

It was mentioned in the 2007 McKinsey report that "the quality of an education system can never exceed the quality of its teachers" [1]. In contrast, OECD reported that the most critical school-related factor influencing student learning is teaching rather than teachers [2]. This is because teachers' behavior is strongly influenced by the educational, socio-cultural, and political environments surrounding them. Whether the most critical key factor in student learning is teachers or teaching, it cannot be denied that teacher education and professional development are crucial to enhancing the quality of both teachers and teaching at all educational levels [3,4].

Recently, the high quality of teacher education and professional development has become ever more important for the development of an education system, in order to enable it to effectively cultivate competitive people who can adapt well and thrive in the future world of work and life [3]. It was revealed that most teachers in OECD countries participated in at least one annual training program to strengthen their teaching professionalism [3]. Although OECD countries had high participation rates in teacher training programs, it is uncertain whether the programs properly reflect the teachers' learning needs for the knowledge and skills necessary in an age of rapid change based on systematic and rational assessment processes. The reason might be that numerous developed teacher

training programs have not utilized rigorous and systematic instructional design processes that include needs assessment [4,5].

For the systematic development of teacher training programs, many instructional designers (i.e., training developers) use instructional design models which incorporate the iterative processes of analysis, design, development, implementation, and evaluation. Within the instructional design process, one of the most critical analysis activities is a needs assessment to identify realistic training goals [6]. This is because even seemingly good training programs fail to satisfy the intended learners' needs if an instructional designer fails to accurately identify their necessary training goals. Therefore, many instructional designers and scholars in the discipline have been paying more attention to needs assessments, resulting in training goals that could reflect the learners' actual needs. This will prevent the incorrect launch of training development projects.

Needs assessments are typically conducted immediately after performance analysis, which aims to verify problems, discover problem causes, and suggest solutions that could be applied to solve the problems, as a part of the front-end analysis in order to establish training goals in response to real problems or opportunities within organizations [6,7]. If training or instruction is one of the optimal solutions to an organizational problem as identified by the performance analysis, then a training or learning needs assessment is implemented to identify instructional goals as an initial step in an instructional design project [6]. Instructional goals focus only on organizational problems that can be resolved through training, and not on all the performance problems that were identified through performance analysis. It might be ideal to employ multiple solutions that may or may not include training to effectively resolve organizational challenges [6].

Training or learning needs assessment is conducted through the process of identifying the observed discrepancies between the desired status (i.e., the "should" status) and the actual status (i.e., the "is" status) [6,7]. More specifically, it is implemented in the following three phases. The first phase involves identifying or establishing an achievement standard, referred to as the desired status, by reviewing the relevant documents. The next phase involves determining the current level of employee performance (the actual status) relative to the achievement standard through tests, observations, interviews, surveys, or various combinations of those. The last phase is to identify the discrepancies or gaps between the desired status and the actual status. These are referred to as the learning or training needs and ultimately result in the establishment of instructional or training goals [6].

In the process of needs assessment, an instructional designer often identifies multiple learning or training needs of the intended learners. However, it can be difficult to effectively address all the needs simultaneously due to limited organizational resources and time constraints. Accordingly, it is essential to systematically prioritize the identified learning or training needs as components of the needs assessment to efficiently resolve employees' performance problems.

Since Borich introduced a methodological model for learning or training needs assessment in 1980, other scholars have developed novel needs assessment approaches to improve upon previous ones [8–12]. Of the various quantitative methods for learning or training needs assessment, the Borich model, the weighted total index (WTI) approach, and the ranked discrepancy model (RDM) could be most remarkable in terms of their originality and improvement. These quantitative methods for learning needs assessments each have unique characteristics.

The Borich model is the longest-standing needs assessment model and is based on a discrepancy analysis between "what should be" and "what is" [12,13]. The most salient feature of this model is that it utilizes the group mean importance rating to account for errors of individual judgment or perceptions of the importance of professional competency. In other words, in this model, weighted discrepancy scores are used for each professional competency by multiplying the discrepancy score by the mean importance rating for each individual. Many scholars and practitioners have utilized the Borich model to identify the

priorities in educational and training needs for professional development since the model was first introduced in 1980 [12,14–16].

In contrast, the WTI approach is a relatively straightforward statistical method that identifies the priorities in learning needs without depending on any assumed probability scheme [9]. This approach is based on the weights for each cell instead of the error weights for the distributed cells. Misanchuk [11] suggested this to overcome the limitation that the scale is infinite. In other words, the WTI is a needs assessment model that improves upon the weakness of the Delta N method using error weights for cells [9].

The RDM is a relatively new approach for determining the priorities in learning needs through a systematic and rigorous assessment of gaps between the importance and performance levels of each professional competency. The most salient feature of the RDM is that it is optimized for addressing ordinal and non-normally distributed data [12,17]. Many needs assessment studies tend to depend on data collected using survey questionnaires consisting of ordinally scaled items that show non-normal distributions [12]. This means that some previous studies that employed such data could result in misinterpretations and incorrect conclusions [18,19]. Accordingly, the RDM can be considered a strong alternative method relative to other learning needs assessment models, especially when using data derived from individual ordinal surveys. However, the RDM needs to be fully verified with empirical data because it remains a relatively novel approach.

Meanwhile, in South Korea, as the importance of career education has been recently emphasized in secondary schools, there has been an increasing interest in the qualifications and quality of career guidance teachers. Career guidance teachers, whose primary role is to help students identify their aptitudes and design their career paths, were first deployed in 2011 to South Korean secondary schools. According to statistics from the Korean Ministry of Education released in 2022, 96.7% of secondary schools have at least one career guidance teacher [20]. Career guidance teachers are generally selected from in-service teachers with a designated experience level [21]. To be qualified as a career guidance teacher, candidates must complete either qualification training courses offered by metropolitan and provincial offices of education or master's degree programs offered by certified graduate schools of education [22]. Additionally, pre-career guidance teachers belonging to certain metropolitan and provincial offices of education should complete rigorous selection processes.

Whatever method is utilized to train career guidance teachers, it is necessary to equip them with sufficient qualifications and competencies for high-quality career education to be accomplished within secondary schools [23]. This means that it is very important to develop a systematic curriculum that provides essential learning experiences for career guidance teachers by addressing their deficiency areas in a step-by-step manner to enable effective career guidance. However, the curricula for cultivating career guidance teachers that were developed relatively recently remain insufficiently empirically verified [22]. This suggests that the learning or training needs assessment of career guidance teachers should be properly conducted as an initial effort to develop an effective curriculum for pre-service and in-service career guidance teachers.

This study has two main purposes. First, it aims to identify and prioritize the learning needs of secondary school career guidance teachers in South Korea using the ranked discrepancy model as an initial effort to improve the pre-service and in-service educational programs of teachers. Second, it aims to explore the viability of the RDM by comparing the results obtained from it with those obtained using the WTI approach and the Borich model, in terms of the priorities of the learning needs of secondary school career guidance teachers and their methodological characteristics. These findings will contribute to clarifying whether the RDM can be widely employed as a quantitative method to accurately assess the intended learners' learning and training needs when using data collected from ordinally scaled survey items.

To this end, the study intends to address the following research questions:

1. What are the relative importance and performance levels of the job tasks required of secondary school career guidance teachers, as perceived by the teachers?

2. What are the priorities in the learning needs of secondary school career guidance teachers, as perceived by the teachers using the RDM?
3. What are the differences observed between the learning needs priorities obtained using the RDM and those obtained using the WTI approach and the Borich model?

2. Methods

2.1. Population and Sample

The target population was career guidance teachers working at South Korean secondary schools. The purposes of this study were to both assess the training needs of career guidance teachers and to compare three needs assessment methods. Greater emphasis was placed on the latter (i.e., assessment methods comparison) in the current study. The data collection process focused on selecting the right informants, who were willing to fill out the questionnaire with sincerity and honesty. Therefore, we began collecting data by contacting teachers who would reliably respond and assist with the study. They proceeded to distribute the questionnaire to nearby teachers and ask them to respond. In this way, data were collected from 75 career guidance teachers from January 2022 to April 2022. Out of these 75 respondents, 26 (34.7%) were male, and 49 (65.3%) were female. A total of 55 (73.3%) worked at high schools, and 20 (26.7%) worked at middle schools. Most of the participants worked at national or public schools ($n = 64$, 85.3%), and the remainder worked for private schools ($n = 11$, 14.7%). All the respondents voluntarily agreed to participate in this study, and all information drawn from them was used anonymously. Table 1 shows detailed participant demographic information.

Table 1. Demographics of the participants.

	Demographics	<i>n</i>	%
Gender	Male	26	34.7
	Female	49	65.3
School Level	Middle School	20	26.7
	High School	55	73.3
Governance	National or Public School	64	85.3
	Private School	11	14.7
School Location	Metropolis	35	46.7
	Small and Medium-Sized City	18	24.0
	Rural Town	18	24.0
	Island and Isolated Area	4	5.3

2.2. Data Collection and Measures

This study employed quantitative data derived from a survey questionnaire utilizing a five-point Likert scale. The questionnaire examined secondary school career guidance teachers' perceptions of the tasks' importance and their self-assessed ability to perform the tasks. This study adopted the exponential non-discriminative snowball sampling method, by which the first subject is recruited and this participant, in turn, recruits several other subjects until there are a suitable number of participants in the sample [24]. The data of this study were collected from secondary school career guidance teachers in South Korea. Generally, there is only one career guidance teacher in each South Korean secondary school. Therefore, the researchers decided to collect data from career guidance teachers known to them.

The sampling procedure was as follows. First, a researcher contacted five known career guidance teachers in a large city. Three of these teachers worked at high schools, and the others worked at middle schools. Fortunately, all of them agreed to participate, and each provided multiple referrals. Almost every referral agreed to participate and subsequently provided additional referrals. This process was repeated until 75 participants were recruited, as there were no additional career guidance teachers who offered to participate. Next, the

questionnaire link was sent to the career guidance teachers via email. Each of the 75 career guidance teachers responded to the questionnaire. Thus, the return rate was a perfect 100% [25].

The questionnaire consisted of 12 items that corresponded, one-to-one, with the 12 job tasks required of secondary school career guidance teachers. The Ministry of Education in South Korea presents the 12 job tasks required of secondary school career guidance teachers [21]. these tasks are as follows: “planning and organizing the school curriculum for career education”, “career and academic counseling for students”, “providing and utilizing school admission guides”, “providing and utilizing occupational information”, “implementing career education programs and activities”, “managing students’ career portfolios and helping them build them”, “conducting and utilizing career aptitude and psychological tests”, “supporting students’ educational transition processes”, “implementing and assisting employment support programs”, “planning and implementing career (e.g., work or college major) experience programs”, “parent education and counseling regarding students’ careers and educational transitions”, and “networking with related communities including public and private organizations.”

The questionnaire consisted of two columns for each item, with the left column used to measure the level of importance of the job tasks required of secondary school career guidance teachers, while the right column measured the performance levels of the job tasks. The descriptions of the items used to measure the level of importance were identical to those used to measure the level of performance. The descriptions of the importance level scales (i.e., none, below average, average, above average, and essential) were almost the same as those for performance levels (i.e., none, below average, average, above average, and exceptional). The Cronbach’s alpha coefficient for the questionnaire was 0.87.

2.3. Data Analysis

This study employed four statistical analysis methods, namely, descriptive statistics, the RDM (ranked discrepancy model), the WTI (weighted total index) approach, and the Borich model. Data for answering the first research question were analyzed using descriptive statistics, including means and standard deviation. The RDM was used to answer the second research question. As described, this study employed a survey questionnaire with a five-point Likert scale that produced ordinal data and used a single item to measure each job task. The RDM is optimized for addressing ordinal and non-normally distributed data [12,17]. Accordingly, the RDM could be an appropriate method for statistical analysis to identify the priorities in the learning needs of secondary school career guidance teachers. Lastly, the collected data were additionally analyzed using the WTI approach and the Borich model to compare the results obtained from the two quantitative methods with those obtained from the RDM. It might be reasonable to compare the findings derived from a new needs assessment model that requires verification with those drawn from the Borich model, which is the most widely used model, and the WTI approach, which is the most creatively enhanced model; thus, this is the approach we take to examine the viability of the RDM.

3. Results

3.1. Research Question 1

Descriptive statistics were conducted to identify the relative levels of importance and performance of the job tasks required of secondary school career guidance teachers. Table 2 presents the importance level rankings of the job tasks required of career guidance teachers as perceived by the teachers, based on the mean scores for each job task. Of the 12 job tasks, the importance level of career and academic counseling for students ranked the highest, whereas implementing and assisting employment support programs was found to rank the lowest.

Table 2. Descriptive statistics and rankings of the importance level of the job tasks ($n = 75$).

Rank	Job Tasks	M	SD	Min.	Max.
1	Career & Academic Counseling	4.87	0.41	3	5
2	School Curriculum for Career Ed.	4.73	0.53	3	5
3	School Admission Guides	4.60	0.59	3	5
4	Career Ed. Programs & Activities	4.56	0.68	1	5
5	Occupational Information	4.48	0.70	1	5
6	Career Experience Programs	4.44	0.79	1	5
7	Educational Transition Processes	4.35	0.73	3	5
8	Parent education & Counseling	4.31	0.77	2	5
9	Career Aptitude Tests	4.24	0.73	2	5
10	Networking with Communities	3.96	0.95	1	5
11	Career portfolios	3.85	0.93	1	5
12	Employment Support Programs	3.65	0.97	1	5

Note. The higher the score of each item, the greater the perceived importance of each task.

Table 3 indicates the performance levels of the job tasks required of secondary school career guidance teachers as perceived by the teachers. The performance level of job tasks required of them were also ranked based on the mean scores for each job task. The findings revealed that secondary school career guidance teachers exhibited the highest level of performance in implementing career education programs and activities out of the 12 job tasks. In contrast, the teachers displayed the lowest level of performance in implementing and assisting employment support programs.

Table 3. Descriptive statistics and rankings of the performance level of the job tasks ($n = 75$).

Rank	Job Tasks	M	SD	Min.	Max.
1	Career Ed. Programs & Activities	4.52	0.58	3	5
2	School Curriculum for Career Ed.	4.47	0.68	3	5
2	Career Experience Programs	4.47	0.66	3	5
4	Career & Academic Counseling	4.35	0.76	2	5
5	School Admission Guides	4.29	0.79	2	5
6	Educational Transition Processes	4.24	0.87	1	5
7	Career Aptitude Tests	4.21	0.79	3	5
8	Occupational Information	3.93	0.83	1	5
9	Parent education & Counseling	3.88	0.90	1	5
10	Networking with Communities	3.73	1.07	1	5
11	Career Portfolios	3.59	0.90	2	5
12	Employment Support Programs	3.24	1.18	1	5

Note. The higher the score of each item, the greater the self-assessed ability to perform the task.

3.2. Research Question 2

Table 4 presents the priorities in learning needs, using the RDM to assess discrepancies between the importance and performance levels for each job task among secondary school career guidance teachers. The analysis procedures using the RDM were as follows. First, the number of occurrences for negative ranks (NR), positive ranks (PR), and tied ranks (TR) were calculated as presented in the left column of Table 4. NR indicates that the ratings for the performance level of respondents were lower than those for the importance level. PR denotes that the ratings for performance level were greater than those for importance level. TR indicates that the performance ratings were equal to those for importance levels. Second, the number of occurrences of NR, PR, and TR were converted into percentages, as shown in the middle column of Table 4. Third, the weights (W) were calculated using the formulas of $WNR = NR\% \times -1$, $WPR = PR\% \times 1$, and $WTR = TR\% \times 0$. Lastly, the ranked discrepancy scores (RDS) were calculated by summing the WNR, WPR, and WTR. While a positive RDS indicated that no learning need existed, a negative RDS indicated that a learning need existed. The higher the negative score, the greater the magnitude of the learning need. The

RDS uses a standardized score that ranges from -100 to 100 . According to the RDM results shown in Table 4, the need to learn how to provide and utilize occupational information (RDS = -48.00) was the top priority for secondary school career guidance teachers. In contrast, they had no learning need for “planning and implementing career (e.g., work or college major) experience programs” (i.e., RDS = 1.34). Table 4 presents detailed information on the prioritization of the learning needs of the sample career guidance teachers.

Table 4. Result of the RDM of the job tasks.

Rank	Job Tasks	Wilcoxon Signed-Ranks			n	Wilcoxon Ranks Converted to %			Weights			RDS
		NR = P < I	PR = P > I	TR = P = I		NR%	PR%	TR%	NR% (-1)	PR% (1)	TR% (0)	
1	Occupational Information	41	5	29	75	54.66	6.66	38.66	-54.66	6.66	0	-48.00
2	Career & Academic Counseling	34	3	38	75	45.33	4.00	50.66	-45.33	4.00	0	-41.33
3	Parent education & Counseling	33	6	36	75	44.00	8.00	48.00	-44.00	8.00	0	-36.00
4	Employment Support Programs	30	7	38	75	40.00	9.33	50.67	-40.00	9.33	0	-30.67
5	School Admission Guides	26	7	42	75	34.66	9.33	56.00	-34.66	9.33	0	-25.33
5	Career Portfolios	26	7	42	75	34.66	9.33	56.00	-34.66	9.33	0	-25.33
7	School Curriculum for Career Ed.	21	3	51	75	28.00	4.00	68.00	-28.00	4.00	0	-24.00
8	Networking with Communities	25	10	40	75	33.33	13.33	53.33	-33.33	13.33	0	-20.00
9	Educational Transition Processes	19	13	43	75	25.33	17.33	57.33	-25.33	17.33	0	-8.00
10	Career Ed. Programs & Activities	20	16	39	75	26.66	21.33	52.00	-26.66	21.33	0	-5.33
11	Career Aptitude Tests	14	13	48	75	18.66	17.33	64.00	-18.66	17.33	0	-1.33
12	Career Experience Programs	13	14	48	75	17.33	18.67	64.00	-17.33	18.67	0	1.34

Note. NR = negative ranks, PR = positive ranks, TR = tied ranks, P = performance, I = importance, RDS = ranked discrepancy scores.

3.3. Research Question 3

The WTI approach and the Borich model were applied to compare the priorities in the learning needs of career guidance teachers obtained from the two quantitative methods with those obtained from the RDM. Analysis using the WTI approach was applied for each job task. Table 5 presents the analysis results of the job task of “networking with related communities including public and private organizations” as an example. The following describes the specific steps. First, the collected data were tabulated using bivariate tables for each job task, as presented in the upper cell of Table 5 as a sample of “networking with related communities including public and private organizations”. Second, the data of each cell were multiplied by its proposed weight, as indicated in the lower cell of Table 5. The proposed linear weight factor scale is presented in Table 6. Third, the weighted total indices for each job task were calculated by dividing the weighted total values for each job task by the total number of respondents. A WTI ranges from 0 to 1, and a WTI lower than 0.5 indicated that no learning need exists. The weighted total index for “networking with related communities including public and private organizations” was 0.528 (i.e., $39.625 \div 75 = 0.528$). Lastly, the 12 job tasks required of secondary school career guidance teachers were ranked using the weighted total indices.

Table 7 shows the detailed weighted total values and weighted total indices information for the 12 job tasks required of career guidance teachers. According to these findings, the need to learn how to provide and utilize occupational information (WTI = 0.568) was the top priority for career guidance teachers. In contrast, they had no learning need for “planning and implementing career (e.g., work or college major) experience programs” (WTI = 0.497).

Table 5. Weighted values of each cell for “networking with related communities”.

Performance	Importance					Total
	1	2	3	4	5	
1	1 0.500	0 0.000	1 0.750	0 0.000	0 0.000	2 1.250
2	0 0.000	2 1.000	5 3.125	0 0.000	0 0.000	7 4.125
3	0 0.000	2 0.750	7 3.500	11 6.875	2 1.500	22 12.625
4	0 0.000	0 0.000	3 1.125	13 6.500	6 3.750	22 11.375
5	0 0.000	0 0.000	1 0.250	4 1.500	17 8.500	22 10.250
Total	1 0.500	4 1.750	17 8.750	28 14.875	25 13.750	75 39.625

Note. The upper figure is the number of respondents corresponding to the cell, and the lower figure is the weighted value of the cell.

Table 6. Linear weight factor scale.

Performance	Importance				
	1	2	3	4	5
1	0.500	0.625	0.750	0.875	1.000
2	0.375	0.500	0.625	0.750	0.875
3	0.250	0.375	0.500	0.625	0.750
4	0.125	0.250	0.375	0.500	0.625
5	0.000	0.125	0.250	0.375	0.500

Source: Abdel-Maksoud; Saknidy [9].

Table 7. Result of the weighted total index approach ($n = 75$).

Rank	Job Tasks	WTV	WTI
1	Occupational Information	42.625	0.568
2	Career & Academic Counseling	42.375	0.565
3	Parent education & Counseling	41.500	0.553
4	Employment Support Programs	41.375	0.552
5	School Admission Guides	40.375	0.538
6	School Curriculum for Career Ed.	40.000	0.533
6	Career Portfolios	40.000	0.533
8	Networking with Communities	39.625	0.528
9	Educational Transition Processes	38.500	0.513
10	Career Ed. Programs & Activities	37.875	0.505
11	Career Aptitude Tests	37.750	0.503
12	Career Experience Programs	37.250	0.497

Note. WTV = weighted total values, WTI = weighted total indices.

Analysis using the Borich model was implemented in a step-by-step manner. First, a discrepancy score for each respondent on each job task required of career guidance teachers was calculated by taking the importance rating minus the performance rating. Second, a weighted discrepancy score for each respondent on each job task was calculated by multiplying the discrepancy scores by the mean importance rating. Third, a mean weighted discrepancy score (MWDS) for each job task was calculated by dividing the sum of the weighted discrepancy scores for every respondent by the total number of respondents. A MWDS ranges from -4 to 20 when using a five-point Likert scale. Lastly, the 12 job tasks were ranked using the MWDS. According to the result of the Borich model presented

in Table 8, the need to learn “career and academic counseling for students” was the top priority among the teachers (MWDS = 2.532). In contrast, they had no learning need for “planning and implementing career (i.e., work or college major) experience programs” (MWDS = −0.118). Detailed information is shown in Table 8.

Table 8. Result of the Borich model ($n = 75$).

Rank	Job Tasks	MIR	MWDS
1	Career & Academic Counseling	4.867	2.532
2	Occupational Information	4.480	2.449
3	Parent education & Counseling	4.307	1.839
4	Employment Support Programs	3.653	1.509
5	School Admission Guides	4.600	1.411
6	School Curriculum for Career Ed.	4.733	1.261
7	Career Portfolios	3.853	1.027
8	Networking with Communities	3.960	0.898
9	Educational Transition Processes	4.347	0.464
10	Career Ed. Programs & Activities	4.560	0.182
11	Career Aptitude Tests	4.240	0.113
12	Career Experience Programs	4.440	−0.118

Note. MIR = mean importance rating, MWDS = mean weighted discrepancy scores.

Table 9 indicates the ranking of career guidance teachers’ learning needs for the 12 job tasks required of them obtained using the RDM, the WTI approach, and the Borich model. As shown in Table 9, the priority in learning needs of career guidance teachers obtained from the RDM was identical to that obtained using the WTI approach, except for the rankings between fifth and seventh places. In contrast, the order of the top two priority job tasks obtained from the Borich model was reversed in comparison to those obtained from the RDM and the WTI approach. Additionally, the rankings between the fifth and seventh places obtained using the RDM were somewhat different from those obtained using the Borich model within the rankings, whereas the rankings obtained using the WTI approach were quite similar to those obtained using the Borich model. Table 9 presents detailed information on the rankings of career guidance teachers’ learning needs for the job tasks required of these teachers.

Table 9. Rankings of learning needs obtained from the RDM, the WTI approach, and the Borich model.

Rank	RDM	WTI	Borich
1	Occupational Information	Occupational information	Career & Academic Counseling
2	Career & Academic Counseling	Career & Academic Counseling	Occupational information
3	Parent education & Counseling	Parent education & Counseling	Parent education & Counseling
4	Employment Support Programs	Employment Support Programs	Employment Support Programs
5	School Admission Guides/ Career Portfolios	School Admission Guides	School Admission Guides

Table 9. Cont.

Rank	RDM	WTI	Borich
6		Career Portfolios/ School Curriculum for Career Ed.	School Curriculum for Career Ed.
7	School Curriculum for Career Ed.		Career Portfolios
8	Networking with Communities	Networking with Communities	Networking with Communities
9	Educational Transition Processes	Educational Transition Processes	Educational Transition Processes
10	Career Ed. Programs & Activities	Career Ed. Programs & Activities	Career Ed. Programs & Activities
11	Career Aptitude Tests	Career Aptitude Tests	Career Aptitude Tests
12	Career Experience Programs	Career Experience Programs	Career Experience Programs

Note. RDS = ranked discrepancy scores, WTI = weighted total indices, MWDS = mean weighted discrepancy scores.

4. Conclusions and Discussion

4.1. Importance and Performance Levels of the Job Tasks Required of Career Guidance Teachers

Of the 12 job tasks required of secondary school career guidance teachers in South Korea, career and academic counseling for students was found to be of the highest importance, while implementing and assisting employment support programs ranked as the lowest. These findings indicate that the main tasks of career guidance teachers should primarily focus on “career and academic counseling for students”, “planning, organizing, and implementing career education programs and activities”, and “providing and utilizing school admission guides.” In contrast, the results indicate that “implementing and assisting employment support programs” and “managing students’ career portfolios and helping them to build them” are of less relative importance than the other job tasks required of secondary school career guidance teachers. Overall, the study findings imply that a large percentage of South Korean secondary school students are more interested in entering a higher education institution than in getting a job after high school graduation. This implication can be supported by recent statistical findings. According to Korean basic education statistics [26], in 2020, 72.52% of all high school graduates went on to a higher education institution, while 6.25% of them were employed. It can be said that the importance levels of the job tasks required of secondary school career guidance teachers reflect the needs of the students for career guidance.

This study also found that secondary school career guidance teachers exhibited the highest level of performance in implementing career education programs and activities. In contrast, the teachers displayed the lowest level of performance in implementing and assisting employment support programs. These findings imply that secondary school career guidance teachers perform the job tasks directly related to career education such as “implementing career education programs and activities”, “planning and organizing the school curriculum for career education”, and “planning and implementing career experience programs” better than the job tasks closely related to employment such as “implementing and assisting employment support programs” and “managing students’ career portfolios and helping them to build them.” This also indicates that career guidance teachers have more competence as teachers than competence as consultants or counselors in South Korea. The reason might be that a career guidance teacher’s certificate is granted only to in-service teachers with a certain amount of teaching experience, and who have earned a master’s degree in career guidance or who have completed the related qualification training courses in South Korea [21]. South Korean general subject teachers tend to have played a greater

role in teaching students academic subjects than consulting with or counseling them. Even after becoming career guidance teachers, they spend a significant time teaching a career subject in classes [27]. Accordingly, the professional development and graduate programs for career guidance teachers may require more emphasis to be placed on strengthening their consulting and counseling skills.

4.2. Instructional Needs for the Job Tasks Required of Career Guidance Teachers

This study found that the learning needs associated with the job tasks required of South Korean secondary school career guidance teachers were ranked in the following order: “providing and utilizing occupational information”, “career and academic counseling for students”, “parent education and counseling regarding students’ careers and educational transitions”, etc. Additionally, there was no indicated learning need for “planning and implementing career experience programs.” These findings indicate that “providing and utilizing occupational information” is the biggest shortfall among the job tasks required of secondary school career guidance teachers compared to its importance, whereas career guidance teachers have the capability for “planning and implementing career experience programs” beyond its importance.

According to Thomas Frey [28], drastic and incessant changes in the occupational world are expected due to the influences of artificial intelligence, robots, etc. More specifically, he predicted that two billion jobs would disappear by 2030 [28]. This prospect, and uncertainty about the future, make it more difficult for career guidance teachers to provide students with the appropriate occupational information and guidance to properly utilize it. This implies that scholars in the career guidance discipline must exigently create more useful and targeted occupational information reflecting future changes in occupations so that career guidance teachers can effectively conduct their job tasks utilizing it. Overall, the present findings related to the learning need priorities of career guidance teachers tend to be congruent with those of previous research [29]. The fact that many of the job tasks required of career guidance teachers displayed large discrepancies also suggests that most of the courses or sessions in the graduate and professional development programs developed for pre-service and in-service career guidance teachers must be updated and improved so that they can be properly equipped with the required skills and capabilities to conduct these job tasks.

4.3. Differences between the RDM Results and Those from the Other Two Models

This study revealed that the RDM-obtained career guidance teachers’ rankings of learning needs associated with the job tasks required of them are very similar to those obtained using the WTI approach. Indeed, it can be concluded that the rankings between the fifth and seventh places obtained from the two models were very similar because the differences were caused by tied rankings. It can also be concluded that there is very little difference between the indicated learning needs priorities obtained using the RDM and those obtained using the WTI approach. This indicates that the RDM has achieved concurrent validity, as the RDM results were almost the same as those from the WTI, which has already been tested and validated [30] and is the refined approach for needs assessment [9]. This finding is very significant, in that it suggests that the RDM can be used as another valid and useful quantitative method for determining priorities in learning needs assessments.

This study also found that there were some differences between the rankings of career guidance teachers’ learning needs for the job tasks required of them as obtained from the RDM and those obtained from the Borich model. More specifically, the top two priority job tasks obtained using the RDM were different from those obtained using the Borich model, respectively. The top two priority job tasks were reversed in order when applying the two approaches. However, there was minimal difference between the first and second rank job tasks in terms of the magnitude of the MWDS. This indicates that the top two priority job tasks obtained using the Borich model were similar to those obtained using

the RDM. The rankings between the fifth and seventh places obtained using the RDM were somewhat different from those obtained using the Borich model. However, seven of the twelve job tasks required of career guidance teachers had the same rankings when comparing the rankings obtained using the RDM with those obtained using the Borich model. This indicates that the results from the RDM and the Borich model demonstrated a great deal of consistency in terms of the rankings of career guidance teachers' learning needs. These findings are generally congruent with those of previous research conducted by Narine and Harder [12]. Consequently, it might be more appropriate to adopt the RDM as an alternative quantitative method for needs assessment relative to the Borich model in cases involving ordinal items, cross-sectional data, or non-normally distributed data [12,17,31]. This study has limitations that future studies should address. First, it focused only on the case of secondary school career guidance teachers to explore the viability of the RDM. Thus, future research should employ more diverse target populations to precisely test and prove the viability of the RDM, thus demonstrating it as a useful and innovative quantitative method for learning needs assessment. Second, the target population of the current study was limited to only career guidance teachers in South Korean secondary schools to determine their learning needs. Accordingly, future research should consider including data from career guidance teachers in various countries to enhance the generalizability of the findings. Lastly, this study recruited 75 career guidance teachers using the exponential non-discriminative snowball sampling technique. Although this sampling method was adopted to collect accurate and truthful data, the sample size of the current study was relatively small. Future research should be conducted with a larger sample size to further confirm the findings of the current study.

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References

1. McKinsey Company. How the World's Best-Performing School Systems Come out on Top. 2007. Available online: <https://tinyurl.com/yc2zhkzm> (accessed on 27 January 2023).
2. OECD. *Finland: Slow and Steady Reform for Consistently High Results in Lessons from PISA for the United States*; OECD Publishing: Paris, France, 2011. [CrossRef]
3. OECD. *TALIS 2018 Results (Volume I): Teachers and School Leaders as Lifelong Learners*; OECD Publishing: Paris, France, 2019. [CrossRef]
4. Czerniawski, G.; Guberman, A.; MacPhail, A. The professional developmental needs of higher education-based teacher educators: An international comparative needs analysis. *Eur. J. Teach. Educ.* **2017**, *40*, 127–140. [CrossRef]
5. Moeini, H. Identifying needs: A missing part in teacher training programs. *Seminar. Net.* **2008**, *4*, 1–12. [CrossRef]
6. Dick, W.; Carey, L.; Carey, J.O. *Systematic Design of Instruction*, 8th ed.; Pearson: London, UK, 2015; pp. 14–39.
7. Kaufman, R.; Guerra-López, I. *Needs Assessment for Organizational Success*; ASTD Press: Alexandria, VA, USA, 2013; pp. 1–10.
8. Abdel-Maksoud, B.M. Developing a modified delta n method for training needs assessment. *J. Agric. Ext. Rural. Dev.* **2010**, *2*, 133–140.
9. Abdel-Maksoud, B.M.; Saknidly, S. A new approach for training needs assessment. *J. Hum. Resour. Sustain. Stud.* **2016**, *4*, 102–109.
10. Borich, G.D. A needs assessment model for conducting follow-up studies. *J. Teach. Educ.* **1980**, *31*, 39–42. [CrossRef]
11. Misanchuk, E.R. Analysis of multi-component educational and training needs. *J. Instr. Dev.* **1984**, *7*, 28–33. [CrossRef]
12. Narine, L.; Harder, A. Comparing the Borich model with the Ranked Discrepancy Model for competency assessment: A novel approach. *Adv. Agric. Dev.* **2021**, *2*, 96–111. [CrossRef]

13. Alibaygi, A.; Zarafshani, K. Training needs of Iranian extension agents about sustainability: The use of Borich's need assessment model. *Afr. J. Agric. Res.* **2008**, *3*, 681–687.
14. Elhamoly, A.I.M.A.; Koledoye, G.F.; Kamel, A. Assessment of training needs for Egyptian extension specialists (SMSs) in organic farming field: Use of the Borich needs model. *J. Agric. Food Inf.* **2014**, *15*, 180–190. [[CrossRef](#)]
15. Garton, B.L.; Chung, N. An assessment of the inservice needs of beginning teachers of agriculture using two assessment models. *J. Agric. Educ.* **1997**, *38*, 51–58. [[CrossRef](#)]
16. Waters, R.G.; Haskell, L.J. Identifying staff development needs of cooperative extension faculty using a modified Borich needs assessment model. *J. Agric. Educ.* **1989**, *30*, 26–32. [[CrossRef](#)]
17. Sullivan, G.M.; Artino, A.R., Jr. Analyzing and interpreting data from Likert-type scales. *J. Grad. Med. Educ.* **2013**, *5*, 541–542. [[CrossRef](#)] [[PubMed](#)]
18. Boone, H.N., Jr.; Boone, D.A. Analyzing Likert data. *J. Ext.* **2012**, *50*, 2TOT2.
19. Kipfer, S.; Pihet, S. Reliability, validity and relevance of needs assessment instruments for informal dementia caregivers: A psychometric systematic review. *JBIEvid. Synth.* **2020**, *18*, 704–742. [[PubMed](#)]
20. Korean Ministry of Education. 2021 Statistical Data on the Placement of Career Teacher. Available online: https://www.data.go.kr/data/15097012/fileData.do#layer_data_infomation (accessed on 2 February 2023).
21. Korean Ministry of Education. *Guidelines for Placement and Operation of Career Guidance Teachers*; Korean Ministry of Education: Sejong, Republic of Korea, 2013.
22. Joo, H.; Yoon, H.; Min, S.; Ryoo, J.; Kim, M.; Do, K. *Strengthening Career Education Competence of Career Guidance Teachers: Focusing on the Job Analysis Results*; Seoul Education Research and Information Institute: Seoul, Republic of Korea, 2021; p. 9.
23. Korean Ministry of Education. *Plan for Promoting School Career Education*; Korean Ministry of Education: Sejong, Republic of Korea, 2018.
24. Etikan, I.; Alkassim, R.; Abubakar, S. Comparison of snowball sampling and sequential sampling technique. *Biom. Biostat. Int. J.* **2016**, *3*, 6–7.
25. Baruch, Y. Response rate in academic studies: A comparative analysis. *Hum. Relat.* **1999**, *52*, 421–438. [[CrossRef](#)]
26. Korean Educational Development Institute (KEDI). *Educational Statistics*; Korean Educational Development Institute: Jincheon, Republic of Korea, 2020.
27. Kim, N.; Bang, J.; Jeong, J. The status and needs of career education in schools identified by career teachers. *J. Career Educ. Res.* **2012**, *25*, 183–201.
28. Frey, T. Demystifying the future: Two billion jobs to disappear by 2030. *J. Environ. Health* **2012**, *74*, 36–39. [[PubMed](#)]
29. Jang, H.; Lee, J. Research on the revision of the standard pre-service training curriculum for the career education & guidance teachers. *J. Career Educ. Res.* **2016**, *29*, 1–21.
30. Creswell, J.W.; Guetterman, T.C. *Educational Research: Planning, Conducting, and Evaluating Quantitative and Qualitative Research, 6th ed*; Pearson: Saddle River, NJ, USA, 2019; pp. 138–203.
31. Ary, D.; Jacobs, L.C.; Sorenson, C.; Walker, D.A. *Introduction to Research in Education*, 9th ed.; Wadsworth: Belmont, CA, USA, 2014; pp. 127–169.

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