Preparing for the Future IT Era: Perceptions of Students with Disabilities About IT Training in South Korea

Dongil Kim
Seoul National University

Jiyoung Son
Cheongju University

Mary Lee Vance
The University of Montana

Abstract

The purpose of the study was to identify the perceptions and needs of students with disabilities with respect to Information Technology (IT) training. Results emerged from a survey of 324 college students with disabilities from 17 universities in South Korea. Survey questions were divided into two sections: (a) perceptions about the relevance and usefulness of, and willingness to participate in training and (b) needs about training contents, method, and accommodations. The majority of students with disabilities perceived that IT skills were relevant to their future career and that it is useful for their career preparation. In addition, most of the students needed training in IT career skills and preferred practical experiences as training methods. Implications and recommendations for future research based on the results are suggested.

Keywords: college students with disabilities, IT training, perception, need, South Korea

In South Korea, there has been a recent and rapid increase in the number of students with disabilities entering junior colleges and universities. According to statistics, while only 5.2% of students with disabilities entered college in 1998, the number has increased every year, reaching 16.3% in 2010 (Ministry of Education, Science and Technology, 2010). This rise is facilitated by a policy called the Special Admission Procedures for Students with Disabilities (SAPSD), which has been implemented since 1995. The purpose of the policy is to guarantee students with disabilities the opportunities for higher education. It is an affirmative action policy for postsecondary students with disabilities (Kim, 2001). Through this policy the entrance quota is not restricted by the government. Schools can freely decide the number of the students with disabilities admitted each year. By this policy, students with disabilities including visual, hearing, and physical disabilities have opportunities to enter colleges without the entrance quota restraint. This has made a distinct difference in the increased number of students with disabilities attending postsecondary institutions.

Two other policies have contributed to facilitating higher education for students with disabilities in South Korea. The Special Education for Persons with Disabilities Act (SEPDA) of 2007 and the Anti-discrimination and Rights Remedy for Persons with Disabilities Act (ARRPDA) of 2007 guarantee students the right to request and receive reasonable accommodations for their college education. The SEPDA has given rise to the establishment of disability support services across many colleges. The legislation was enacted to ensure that colleges make reasonable modifications for the full participation of students with disabilities. More importantly, it stipulates that colleges are obligated to establish disability support centers staffed by person-

nel who are exclusively responsible for working with students with disabilities. It is worth noting that SEPDA clearly defines supporting higher education for students with disabilities for the first time. It is, however, rather limited to setting up the support committee and the center for students with disabilities, which indicates that more comprehensive and detailed policies are lacking (Kim, Son, Kim, Kang, & Jeong, 2009). ARRPDA additionally charges colleges with making more efforts to provide facilities, services, and human resources so that students with disabilities do not encounter discrimination. However, as the committees in charge are not independent, there are concerns that orders for correction can be made only in a limited form (Kim et al., 2009). Currently, provisions defining higher education for the students with disabilities are limited and are not considered in a variety of circumstances. Therefore, it is time for the government to intervene so that these provisions can take effect in reality.

As of 2011, the number of students with identified disabilities in South Korea was 5,149, for universities 1,156 for junior colleges, and 315 for graduate schools (Ministry of Education, Science & Technology, 2011). These numbers make up only 0.2% of all Korean college students. Concerning the current situation by the types of disability, the number of students with physical disabilities who were enrolled is 3,965, occupying 57.3%, which is more than half of the students with disabilities on the whole, while the number of enrolled students with visual disabilities is 1,024 and those with hearing disabilities who were enrolled is 944, occupying the second and third largest categories, respectively. These results show that compared to the United States, where more than 10% of college students have identified disabilities (National Center for Education Statistics, 2008), the ratio of students with disabilities in Korea is significantly low, with only 0.2%. As for the types of disability, students with learning disabilities occupy the highest percentage in the United States (National Center for Education Statistics, 2008), while in Korea, those with physical abilities are the most numerous. The significant difference is that in the United States, students with various kinds of disabilities including learning disability, intellectual disability, and emotional disability apply to higher education and often become eligible for accommodations, while in South Korea, students with such disabilities are not generally considered for college education. This suggests that in South Korea's future, questions remain about how

broadly existing laws and policies will apply to the full range of individuals with disabilities.

Even though there have been significant positive changes in the number of college admissions, the college life of students with disabilities after admission still leaves much to be desired. Among studies on students with disabilities in South Korea, Kim (2001) found that the ratio of those who are placed on academic probation, take time off, or drop out is higher among students with disabilities. In addition, Kim, Park, and Lee (2003) found that students with disabilities have a lower level of academic achievement and are generally dissatisfied with academic supports provided by the universities. In a similar context, Kim, Lee, Kim, Kim Hye, and Park (2004) conducted a qualitative study on the difficulties of campus life for students with disabilities. Students reported that the lack of support and accommodation in classes made it hard for them to succeed in their courses. They also reported experiencing alienation and difficulties when entering the workforce. College students and faculty members' lack of understanding was also referenced.

The Ministry of Education, Science & Technology in South Korea launched evaluations of support services to college students with disabilities in 2003, 2005, and 2008. These included on-site evaluations by specialists who assessed various fields such as admissions, teaching and learning support, facilities and equipments. Evaluations of 192 universities and junior colleges, in which one or more students with disabilities attended as of 2008, revealed that 112 (63%) universities needed improvements. While this situation reflected an improvement compared to earlier evaluations in 2005, the results showed that support system for students with disabilities was still insufficient. With increasing numbers of students with disabilities in South Korea, there is a growing recognition of a need to provide higher education services for students with disabilities. While government policies are increasing the supports that are now provided in college environments, there are still areas for improvement.

In order to help alleviate these problems, several technology concepts have been addressed as South Korean colleges and universities have enhanced the provision of services to students with disabilities. Technology has been found to help students with a wide range of abilities prepare for and succeed in college life. For people with disabilities, technology has the potential to maximize their independence and

participation in academic programs as well as help with career preparation and other college activities (Burgstahler, 2003). Also, it can help reduce the problems that students with disabilities encounter in the college environment. For example, students with mobility impairments can use a variety of adaptations, from dictation programs to voice control software, that allow hands-free dictation and menu controls. Likewise, software and hardware that allow one-handed typing, along with a variety of alternative mice and computer input devices, are among the most widely-used forms of adaptive equipment (Fichten, Asuncion, Robillard, Fossey, & Barile, 2003). Technology provides students with disabilities the ability to gain access and improve their quality of life.

As the new trend in technology concepts, Information Technology (IT) is rapidly expanding in all fields. With the development and expansion of IT worldwide, employment in IT fields such as computer-related jobs, electronics, and communication technology continues to increase. The number of South Korean jobs in the IT field also increased significantly. Nearly 6% of adults in the workforce now have jobs in the IT field, which is close to the Organization for Economic Co-operation and Development average ([OECD], 2011). With this global trend, college students pay more attention to IT in order to prepare for success in the job market.

In South Korea, higher education has recently focused on training IT professionals. In 2006, the Ministry of Information and Communication launched education programs for developing IT specialists through university programs. Specifically, the government created internships in IT for college students, supported revision of curriculum in IT-related departments, and encouraged education based on state-of-the-art IT (Lee, Yu, & Ahn, 2004). Furthermore, the Ministry of Education and Human Resources Development supported IT-related specialized programs to build the system of developing human resources (Lee, 2006). Additionally, universities have provided a variety of educational programs to help students prepare to acquire certificates in IT fields such as Java and Oracle. In 2011, Seoul National University began providing education programs for smart device applications development to help students remain current with recent IT skills areas.

Clearly, this IT era can provide students with new opportunities. Postsecondary education is supporting the need for computer literacy by providing students opportunities to learn and use new technologies in all aspects of their schooling (Fichten et al., 2003). IT-related skills are closely related to effective preparation for successful employment. Consequently, there are higher demands for IT education among college students. In this context, the perceptions of college students with disabilities have also been affected by a growing focus on IT training. This trend influences students with disabilities in their preparations for jobs and also the manner in which colleges and universities can support those students. That is, students with disabilities have come to consider IT-related majors and future occupations, thus increasing their demands for education in IT fields to a considerable degree. If students with disabilities are technologically illiterate, they will be less competitive in the future labor market.

Yuck (2003) examined 117 workers with disabilities in IT fields in South Korea. These workers were mostly in charge of the management of system operation, software development, and office work. The study showed that these workers were generally satisfied with their jobs and that they received wages much higher than that of the workers with disabilities on the whole. According to another survey on disability employment conditions in 2000, 32.4% of people with disabilities reported that they preferred computer and information processing-related vocational trainings (Yuck, 2003). As more and more people with disabilities express a preference for IT jobs, IT career preparation programs for students with disabilities have grown in South Korea.

Despite some existing studies, research examining the specific IT training-related needs of college students with disabilities is still in its early stage in South Korea. Until now, attention has been on high school graduates and adults with disabilities (Yuck, 2003), while college students' perceptions about and actual IT training needs have largely been ignored. Moreover, current IT training programs for people with disabilities are not for those who already have intermediate or advanced skill sets. Rather, training has historically focused mainly on the acquisition of basic computer skills.

Therefore, the purpose of the study was to identify the perceptions and needs of postsecondary students with disabilities with respect to IT training. First, the study surveyed students' perceptions about the relevance of IT skills for their future vocations, the usefulness of IT training for career preparation, and

their willingness to participate in such trainings. Additionally, the impact of certain variables (i.e., gender, major, type of disabilities, and severity of disabilities) on students' perception level was measured. Second, students were surveyed to highlight their specific needs with respect to IT training programs. They were asked to share their ideas concerning preferable areas of IT fields, training content, preferred instructional methods, and academic accommodation requirements in order to identify the optimal learning environment for college students with disabilities.

Method

Participants

In order to identify students' perceptions of IT training for career preparation, 324 students with disabilities from 17 universities in South Korea were surveyed. All participants were enrolled at the time of the survey. Of the 324 students, 188 students were male (58.2%) and 135 students were female (41.8%) ranging in age from 18 to 53 (M = 24.0, SD =5.4). The number of students enrolled in small universities was 158 (48.8%) while 166 respondents (51.2%) were enrolled in large universities. They studied the following academic areas: liberal arts and social studies (56.8%, n=184), natural science and engineering (17.6%, n=57), art and gymnastics (13.0%, n=42), education and rehabilitation (11.4%, n =37), and other (1.2%, n=4). Most of the students were in a degree granting program at the undergraduate level. Freshmen comprised 32.4% (n=101), sophomores 29.5% (n=92), juniors 18.9% (n=59), and seniors 16.3% (n=51) of the total number of students surveyed. Additionally, nine students (2.9%) were in graduate level programs.

Students reported the following types of primary disabilities: physical disabilities (52.0%, n=168), hearing impairment (27.9%, n = 90), visual impairment (14.9%, n=48), and others (i.e. multiple disorders, health impairments) (5.2%, n=18). Severity of the disability was as follows: severe/profound (66.8%, n=215), moderate (24.2%, n=78), and mild (9.0%, n=29). In South Korea, medical institutions diagnose disabilities and decide the severity of disability, with grades from 1 to 6, according to the Welfare Law for the Disabled. This study defined grade 1-2 as severe/profound, 3-4 as moderate, and 5-6 as mild. The characteristics of the participants are shown in Table 1.

Instrumentation

The researchers developed a questionnaire pertinent to perceptions and needs for IT training based on a review of previous research and experiences in South Korea. In Yuck's study (2005), the contents of the interviews dealing with employees with disabilities in the IT field was referenced. Additionally, the format of the survey items in Hill's study (1996) was incorporated into the questionnaire. In the survey, questions were divided into two sections: (a) students' perceptions about the relevance of IT training, the usefulness of IT skills, and their willingness to participate in trainings, and (b) students' training needs, including their preferred area of IT fields, training content, instructional methods, and academic accommodations that would be needed. To ensure the validity of the questionnaire, two Ph.D.'s who had conducted related research were consulted to review and modify questions as necessary. The questionnaire included a series of forced choice questions (i.e., How much do you think IT training is related to your future jobs? How much do you think IT training is useful to your job preparation? How much do you think you are willing to participate in IT training programs?). Students could choose multiple answers for questions concerning their perceptions and needs (i.e., Of the following IT fields, which area do you prefer? Of the following, which content do you think is needed for IT training? Of the following, which teaching method do you think is effective for IT training?). Also, demographic questions ranged from age and gender to postsecondary education (e.g., institution attended, academic standing).

Procedure

Universities that had more than ten students with disabilities enrolled, based on the 2008 National Report in South Korea (Ministry of Education, Science & Technology, 2008), were invited to participate in this study. In 2009 between March 10th and 31st, the survey was forwarded nationally to the 45 eligible universities in South Korea. Subsequently, questionnaires were sent to each student with a disability in a paper-based format as well as electronically, using the staff in charge of the disability service center at the universities to distribute the survey. A total of 1,000 questionnaires were sent to the universities and 324 (32.4%) students from 17 universities responded to the questionnaire.

Table 1

Characteristics of the respondents in the research

Variable	Respondents (N=324)	
	N	%
Gender		
Male	188	58.2
Female	135	41.8
No response	1	
Size of University		
Small	158	48.8
Large	166	51.2
Area of Study		
Liberal arts and social studies	184	56.8
Natural science and engineering	57	17.6
Arts and gymnastics	42	13.0
Education and rehabilitation	37	11.4
Others	4	1.2
Level of Study		
Freshman	101	32.4
Sophomore	92	29.5
Junior	59	18.9
Senior	51	16.3
Graduate level	9	2.9
No response	12	
Type of Disability		
Physical disabilities	168	52.0
Hearing impairment	90	27.9
Visual impairment	48	14.9
Others	18	5.2
Severity of Disability		
Severe/profound	215	66.8
Moderate	78	24.2
Mild	29	9.0
No response	2	

Data Analysis

Descriptive summaries of the survey results from the 324 students with disabilities were recorded. In order to compare students' characteristics concerning perceptions, the Pearson's chi-square test was implemented. Since the questions about students' needs could have more than one answer, an analysis of frequency was conducted based on multiple responses.

Results

The findings are based on the responses from the participating 324 college students with disabilities in South Korea. In order to identify students' perceptions and needs regarding IT training, a survey investigated their perceptions about the relevance and usefulness of, and their willingness to participate in IT training. The study also sought to identify students' specific needs that should be met through some form of a training program. The survey results for each question are summarized as follows.

Students' Perceptions of IT Training

Perceived relevance of IT skills to future career. The majority of students responded that with respect to their future career, IT skills were highly relevant (35.5%, n=115) or relevant (46.6%, n=151). Only 9.3 % (n=30) of the students answered that IT skills were not relevant to their future career and the remaining students (8.6%, n=28) stated that they did not know if IT skills were relevant. The respondents were positive about IT skills from the perspective of recognizing that it could be helpful in preparing them for a future career. A majority of college students with disabilities participating in the survey perceived that IT skills were directly or indirectly relevant to their future career.

Perceived usefulness of IT training for career preparation. Students were asked to indicate their perceptions of how useful IT training would be in preparing them for a successful future career. The majority of students indicated that IT training would be highly useful (42.6%, n=138) or useful (43.2% n=140) in preparing for their career. Only 2.8 % (n=9) stated IT training would not be important for their career and the remaining students (11.4%, n=37) stated they did not know the importance.

Willingness to participate in the IT training program. Students were asked to indicate their willingness to participate in IT training programs in the future. The

willingness of most students was very high (28.7%, n=93) or high (55.2%, n=179). Only 6.2 % (n=20) of the students answered that they did not want to participate in future training programs and the remaining students (9.9%, n=32) mentioned they did not know (see Table 2)

Impact of Student Variables on Students' Perceptions

Several analyses were conducted to determine whether specific student variables (i.e., gender, major, type of disabilities, and severity of disabilities) had a significant impact on participants' perceptions of information technology (see Table3). Students' responses (i.e., highly relevant, relevant, not relevant, don't know) were analyzed in order to identify the impact of individual variables. The Pearson's chi square tests were conducted to examine the impact of individual variables (i.e., gender, size of university, area of study, level of study, type and severity of disability) in the questions of the perceived relevance, usefulness, and willingness.

First, the ratings of the perceived relevance of IT skills to future careers had similar patterns regardless of gender, class, and major. The only significant differences found were in the types of disabilities (chi-square=17.474, p<.05) and severity of disabilities (chi-square=18.887, p<.05). In regard to the type of disability, 38.7% of participants with a physical disability expressed that the relevance was very high and 44.0% rated it as relevant. Meanwhile, only 33.3% of the students with a visual impairment and 32.6% with a hearing impairment mentioned that the relevance was very high. In terms of the severity of the disability, 41.1% of the respondents with severe disabilities indicated that relevancy was very high, while 25.6% with moderate disabilities and 20.7% with mild disabilities rated that relevancy was very high.

Second, the perceived usefulness of IT training for career preparation showed similar rating patterns when gender, class, major, and severity of disabilities were investigated. The only significant differences were found in the types of disabilities (chi-square=21.474, p<.05). This means that 49.7% of the students with physical disabilities answered that the usefulness was very high, while 44.7% of the students with visual impairment and 32.2% of the participants with hearing impairment mentioned that IT training had a high degree of usefulness.

Finally, students' willingness to participate in an IT training program showed similar results regardless

Table 2

Students' Perceptions of IT Training

	Respondents (N=324)	
Variable	N	%
Relevance of IT skills to future career		
Highly relevant	115	35.5
Relevant	151	46.6
Not relevant	30	9.3
Don't know	28	8.6
Usefulness of IT training for career preparation		
Highly useful	138	42.6
Useful	140	43.2
Not useful	9	2.8
Don't know	37	11.4
Willingness to participate in the IT training program		
Highly willing	93	28.7
Willing	179	55.2
Not willing	20	6.2
Don't know	32	9.9

Table 3

Impacts of Students Variables on Students' Perceptions

	Pearson's Chi Square		
Variable	Relevance	Usefulness	Willingness
Gender	1.49	0.97	4.89
Size of University	7.48	3.53	2.78
Area of Study	17.91	11.68	15.25
Level of Study	20.10	16.82	7.08
Type of Disability	17.47*	21.47*	6.40
Severity of Disability	18.89*	6.78	8.03

$* p < .05$

of gender, class, major, types of disabilities, and severity of disabilities. None of the student variables had a significant impact on their willingness to participate in IT training.

Students' Needs for IT Training Program

Preferable area of IT training. All items about students' needs had multiple responses. In terms of preferred areas within the IT fields, a majority of the students (63.0%, n=204) showed interest in managing computer software (e.g., Word, Excel, PowerPoint). Web data management was mentioned by 32.4% of the students (n=105). The rest of the students' preferred areas are summarized as follows: Web designing (28.7%, n=93), computer programming (17.0%, n=55), computer networking (13.6%, n=44), network security (13.0%, n=42), and computer system management (12.3%, n=40).

Training content. Students described their IT training needs for future career preparation. The majority of students (55.2%, n=179) stated that they needed to be provided more advanced IT skills that would better prepare them for an IT professional career. Fifty percent (n=162) of the students expressed the need for increased interpersonal and social skills in order to more appropriately relate to co-workers and supervisors. In addition, 43.5 % (n=141) mentioned the need for training that dealt with communication and presentation skills and 38.5 % (n=124) considered problem-solving skills in real-world settings as a need. Added to this, 32.4 % (n=105) stated a need for cooperation skills. Finally, 23.5 % (n=76) expressed a need for career counseling and knowledge of mathematics, science, and statistics.

Instructional method in training. More than half of the participants, or 60.2% (n=195), expressed a need for career skills and an individual practicum. In addition, 50.9% (n=165) preferred internships and work experiences in a real IT workplace, 30.6 % (n=99) identified preferences for small-group IT projects, and 20.4% (n=66) expressed an interest in workshops held by IT company workers.

Academic accommodation in training. More than one-third of the participants, or 39.2% (n=127), mentioned that they would need auxiliary aids and helpers to assist students in wheelchairs as they navigated the campus. In addition, 38.3 % (n=124) of the participants said they would need text files for textbooks and lecture notes. Additionally, 31.2 % (n=101) expressed a need

for sound or video files for lectures. Sign language interpretation and text translation were identified as a need by 29.6 % (n=96) of the respondents. Finally, 25.9 % (n=84) noted a need for assistive technology support and 25.6 % (n=83) identified transportation support as a need (see Table 4).

Discussion

The purpose of the study was to identify the perceptions and needs of college students with disabilities in South Korea with respect to IT training for career preparation. Regarding their perceptions on the relevance of IT skills, most students with disabilities perceived that IT skills were relevant to their careers. Students also reported that IT training would be useful in preparing for their future careers. Most of them expressed willingness to participate in IT training programs. The results of this study indicate that the majority of the students with disabilities perceived IT skills as critical components for their successful career planning and preparation. Also, the results imply that students with disabilities in South Korea perceive that a strong IT background can improve their prospects in successful career planning, preparation, and employment.

This research lays a foundation for college IT training programs. The results indicated that there are significant levels of needs for IT training programs in South Korean institutions of higher education. Students want an education that can improve their ability to pursue career opportunities in high-tech fields previously unavailable to them. Hence, universities need to provide accessible programs that can help students with disabilities develop advanced IT skills.

In addition, the research findings illustrate that a student's type and severity of disability impacts his/her perception of the relevance of IT training for future careers. The perceived usefulness of IT training for career preparation was also influenced by the participant's type of disabilities. The more severe the student's disability, the greater the perceived need for IT training programs. Also, students with physical impairments attached a greater level of importance to IT training than did the students with visual or hearing impairments. This result bears a strong resemblance to a previous research in South Korea (Yuck, 2003) where more persons with severe physical disabilities completed IT trainings. The results can be interpreted simply that, the greater the severity of a physical dis-

Table 4

Students' Needs for IT Training Program

Variable	Respondents (N = 324) (multiple responses)	
	N	%
Preferable area in IT fields		
Managing computer software	204	63.0
Web data management	105	32.4
Web designing	93	28.7
Computer programming	55	17.0
Computer networking	44	13.6
Network security	42	13.0
Computer system management	40	12.3
Training contents		
Professional it career skills	179	55.2
Interpersonal and social skills	162	50.0
Communication and presentation skills	141	43.5
Problem-solving skills	124	38.5
Cooperation skills	105	32.4
Career counseling and basic knowledge of mathematics, science, and statistics	76	23.5
Instructional method		
Career skills training and individual practicum	195	60.2
Internship and work experience	165	50.9
Small-group work projects	99	30.6
Workshops	66	20.4
Academic accommodation		
Auxiliary aids and helper	127	39.2
Text files for textbooks and lecture notes	124	38.3
Sound or video files for lectures	101	31.2
Sign language interpretation and text translation	96	29.6
Assistive technology	84	25.9
Transportation support	83	25.6

ability, the greater the perception that IT training will have a positive effect on a student's future career. Therefore, in order to provide effective and systematic training programs to college students with disabilities, disability variables such as type and severity should be considered.

Recommendations

First, plan systematic training programs in the field of IT skills based on the individual needs of students with disabilities. In spite of the great needs for IT training programs, the current educational programs are not sufficient to meet the specific needs of the students with disabilities. Programs are needed that can provide IT skills directly related to students' future careers. In addition, this study and others have shown that students have a variety of needs ranging from basic IT literacy to advanced level for all career fields, including high tech. Also, the research findings indicated that the students recognized they needed interpersonal and social skills. This finding implies that the students may have been socially isolated or lack social skills and confidence to compete for employment. Therefore, IT training programs should be provided at various levels of knowledge and skill so that students can select trainings based on their individual needs.

Second, provide practical work-based IT training so that students can make a smooth transition from the college to the workplace. Regarding their needs for instructional methods, most students preferred individual practice, internship, and work experiences. As this study's results demonstrate, it has become more important for students with disabilities to gain work-based experience in the IT field. As one of the most effective learning methods, work-based learning, has drawn a lot of attention. Work-based IT training helps students acquire job skills, explore accommodation options, and learn how to use IT in work settings (Luecking & Fabian, 2000). Through work-based training, students with disabilities can apply theories learned to an actual work setting. Furthermore, they can develop practical communication skills and easily gain contacts for employment after graduation.

Third, incorporate individual and various accommodation plans into the IT training program. The most frequently needed types of accommodations cited by participants in this study include auxiliary and mobility supports. Large numbers of respondents also expressed a need for helping persons, followed by accessible lecture audio or video files. These accommodations, including alternative materials, assistants, and digital devices, can ensure accessible IT training that promotes positive academic and career outcomes for students with disabilities.

Recommendations based on the results must be considered with respect to several limitations. The current study was limited in sample size. A larger, random sample of college students with disabilities would be preferred. A follow-up study of a suitably large random sample should be continued and explore significant implications of survey data. Also, further research should be conducted to identify the instructional strategies and successful factors for students with disabilities in IT training program. The study should explore in more detail best practices needed at the universities for students with disabilities and what would be required to provide the necessary accommodation in South Korean colleges and universities.

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About the Authors

Dongil Kim received his BA degree in Department of Education from Seoul National University, South Korea, and M. A. and Ph.D. in Department of Educational Psychology from University of Minnesota. His experience includes working as a research associate at Developmental Studies Center in California, a counseling professor at Korea Youth Counseling Institute in Seoul, a professor at Kyungin National University of Education in Incheon. He has published more than 100 peer-reviewed journal articles and 20 books nationally and internationally. He is currently a professor in the Department of Education, the director of Special Education Research Institute at Seoul National University and the president of Korea Children and Adolescents Counseling Association. His research interests includes talented minority in relation to resilience, quality of life technology, curriculum-based measurement, and learning disabilities. He can be reached by email at: dikimedu@snu.ac.kr.

Jiyoung Son received her BA degree in Department of Special Education from Ewha Womans University, South Korea and Ph.D. in Department of Education from Seoul National University, South Korea. Her experience includes working as a special educator for Child Development Training Institute in Korea and a research professor for Catholic University of Korea. She is currently a professor in the Department of Teacher Education at Cheongju University, South Korea. Her research interests include special education technology and higher education for students with disabilities. She can be reached by email at: sonjy@cju.ac.kr

Mary Lee Vance earned her Ph.D. from Michigan State University, and has been a full-time higher education professional since 1984. She is currently the Director of Academic Advising at Purdue University Calumet.

She is serving her second term on the AHEAD Board of Directors and is also lead authoring a publication that is in progress for NASPA (Student Affairs Administrators in Higher Education) titled *Beyond the ADA: Inclusive Policy and Practice for Students with DIsabilities in Higher Education.* In 2007 AHEAD published an anthology that she edited called DISABLED Faculty and Staff in a Disabling Society: Multiple Identities in Higher Education. NACADA (National Academic Advising Association) published a monograph that she

lead edited Advising Students with Disabilities: Striving for Universal Success, 2nd edition. Vance serves on the Editorial Board for the AHEAD JPED (Journal of Postsecondary Education and Disability), is a reviewer for the NACADA National Academic Advising Association Journal, and a NACADA consultant for disability and cultural diversity topics. In addition to these activities, Vance has published and presented on a wide variety of topics internationally, and has earned numerous awards in recognition of her accomplishments. Her primary areas of research and expertise include wounded warriors, disability services, academic advisement, career services and multiple identities. She may be reached at maryleevance@aol.com.

Author Note