International Journal of Applied Engineering Research
ISSN 0973-4562 Volume 10, Number 10 (2015) pp. 27225-27232

http://www.ripublication.com

The Development of Universal Design for Students with Visual Impairments in Educational Contexts

Jong-Gu Kang

Department of Elementary Special Education, Daegu University, Jilyang, Gyeongsan, Gyeongbuk, 712-714, Republic of Korea
E-mail: jgkang@daegu.ac.kr

Abstract

Students with visual impairments experience various difficulties in their educational contexts. These difficulties can come from various ways such as physical difficulties, academic difficulties, and social difficulties. This study attempted to explore a way, universal design, to support students with visual impairments to reduce their difficulties in educational contexts. It shows that universal design for students with visual impairments needs to take three considerations: the types of places, the types of disabilities, and the types of themes. Based on these considerations, this study displays some examples of universal design that can be developed for students with visual impairments.

Keywords: Students with Visual Impairments, Educational Contexts, Universal Design

1 Introduction

Educational approaches towards students with disabilities have been changed in South Korea and USA. These changes include attitudes towards students with disabilities, educational placements, and educational methods [3, 11]. First, educational attitudes towards students with disabilities have been changed as taking more positive attitudes compared to the past time [3, 11]. Second, educational placements of students with disabilities have been changed from separate placements (e.g., special school) to more inclusive placements (e.g., general school) [3, 11]. Third, various educational methods such as universal design have been developed in the education for students with disabilities [3, 6, 8, 9]. Although special education for students with disabilities has been changed in many ways, students with disabilities still experience a lot of

difficulties in their educational contexts. Therefore, educators need to make efforts to reduce these students' difficulties.

Universal design is a way to support the education of students with disabilities. Universal design was first developed in architecture, and it means a design that can provide both people with disabilities and non-disabled people with convenient accesses and uses [3, 8, 10]. Universal design can be applied to all students including students with disabilities in educational contexts [2, 6, 8, 9, 10, 14, 15].

Special education requires students with disabilities to receive appropriate educational services. However, this does not mean that students with disabilities have to receive same educational supports regardless of their own characteristics. On the contrary, students with disabilities are different among themselves, and they need to receive appropriate supports according to their own characteristics including the types of disabilities [1, 3, 11]. As students with disabilities are different among themselves, universal design needs to reflect students' various characteristics [8, 13]. This study focuses on students with visual impairments among various types of disabilities, and attempts to explore universal design for students with visual impairments in educational contexts.

There are some studies on universal design related to students with visual impairments [e.g., 8, 13]. However, these studies are not sufficient to understand various characteristics of students with visual impairments. Therefore, this study explores the considerations on universal design of students with visual impairments and displays some examples about the development of universal design.

2 Understanding of various characteristics

Universal design for students with visual impairments can be developed according to the types of places, the types of disabilities, and the types of themes.

2.1 The types of places

The major placement of students with disabilities in USA is general schools [1, 3]. Similarly, the major placement of students with disabilities in South Korea is general schools [11]. However, the placement of students with visual impairments in South Korea is quite different compared to other disabled students. In South Korea, students with visual impairments attend special schools more than general schools. In other words, unlike other types of students with disabilities, the major placement of students with visual impairments is special schools [4, 12]. Special schools are quite different in many areas in comparison with general schools. They are designed to be appropriate for students with disabilities. For example, special schools are mostly composed of special education teachers, disabled students, and facilities appropriate to disabled students. On the contrary, general schools are typically designed to satisfy non-disabled students' needs. Therefore, educators need to recognize that students

with visual impairments can receive different educational services according to their educational placements.

Nevertheless, as universal design needs to be designed in order to be applied in every place that those with visual impairments attend, it is necessary to be applied in both general schools and special schools. Although students with visual impairments seldom meet non-disabled peers in special schools, they have to live in the society which is mostly composed by non-disabled people [4]. As universal design is designed for everybody [3, 8, 10], it can also be developed in special schools as a way to include both people with visual impairments and non-disabled people. In schools, these places can be classroom, playground, cafeteria, and others.

2.2 The types of disabilities

Universal design for students with visual impairments needs to be developed according to the types of disabilities. Students with visual impairments can be classified as three types of disabilities: low vision, blindness, and multiple disabilities [5, 7]. Students with visual impairments who do not have additional disabilities such as intellectual disabilities and hearing impairments can be different from those with multiple disabilities. For example, if some students have additional disabilities as well as visual impairments, they will need to receive more intensive supports in comparison with students with visual impairments who do not have additional disabilities.

In addition, since the types of visual impairments generally influence the major methods to see objects, they can be an important consideration in the development of universal design. For example, if some students are diagnosed as low vision, they will be able to read books by using their eyes or optical devices. On the contrary, if some students are diagnosed as blindness, they may only be able to read braille books [1, 3, 11]. Therefore, it is necessary to consider the types of disabilities while developing universal design for students with visual impairments.

2.3 The types of themes

A study analysed articles published in “Journal of Visual Impairment & Blindness” during 2008-2010 [7], and classified collected articles into 9 themes. Another study analyzed articles published in “The Korean Journal of Visual Impairment” during 2011-2013 [5], and classified collected articles into 8 themes. Two studies are not only different in the number of themes but are also different in the numbers of articles dealt in each theme. In particular, whereas [7] displays orientation and mobility(O&M) as an important theme among reviewed articles, [5] shows that there was no study concentrating on O&M in reviewed articles. Nevertheless, two studies imply that some themes on students with visual impairments need to be more extensively discussed. As the analysis of two studies shows that students with visual impairments can experience more expansive difficulties in some themes, universal design may first need to focus on specific themes.

3 Examples on the development of universal design

As students with visual impairments have various characteristics [1, 3, 11], universal design can be developed in various ways by reflecting students' characteristics. The next examples are some samples of universal design that can be developed according to the types of places, the types of disabilities, and the types of themes.

3.1 The types of places

Special schools for students with visual impairments are quite different from general schools, and facilities, in particular, can be very different between two placements [1, 3, 11]. However, when universal design is developed in special schools or in general schools, it needs to consider various places in schools. For example, students with visual impairments can take classes with their peers, or they can spend their time on hallways, cafeteria, and other places. Therefore, the development of universal design needs to consider various places in school. Figure 1 shows the development of universal design according to the types of places.

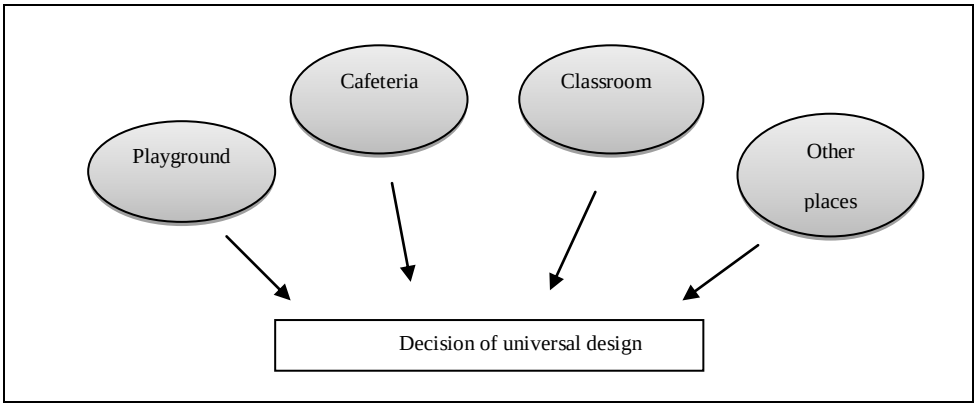

Fig. 1: The development of universal design according to the types of places

3.2 The types of disabilities

Universal design needs to consider the types of disabilities, and it can be differently applied according to the types of disabilities. For example, universal design for students with blindness will require different class materials compared to those with low vision. Figure 2 shows the development of universal design according to the types of disabilities.

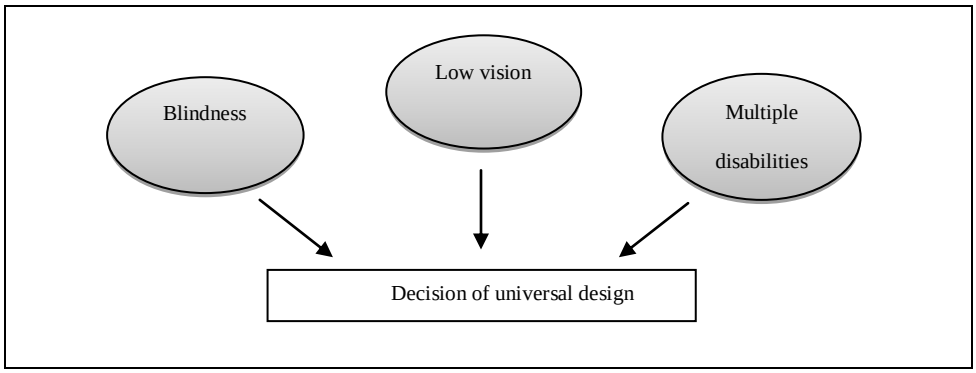

Fig. 2: The development of universal design according to the types of disabilities

3.3 The types of themes

Universal design can be differently developed according to themes. For example, the universal design for the theme of education can be differently developed from the universal design for the theme of independent living. Figure 3 shows the development of universal design according to the types of themes.

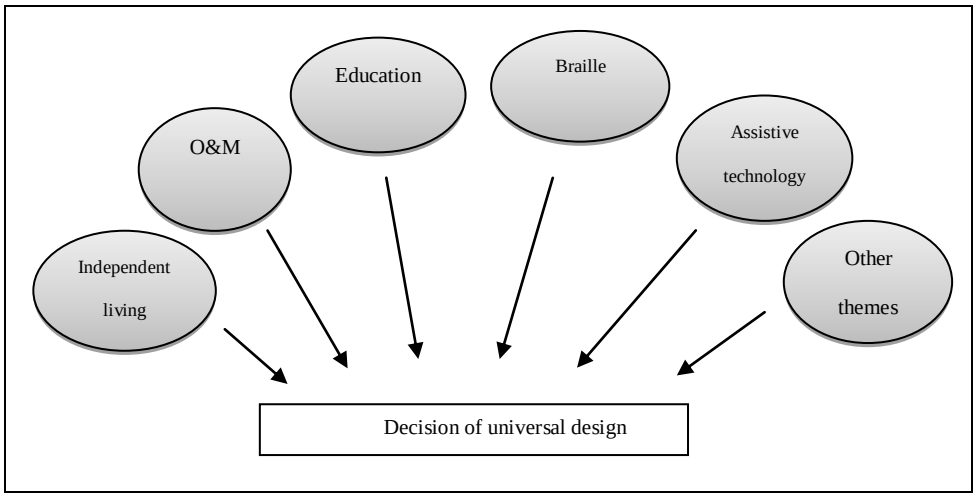

Fig. 3: The development of universal design according to the types of themes

3.4 A comprehensive model of universal design

While universal design for students with visual impairments can be differently developed according to the types of places, the types of disabilities, and the types of themes, it can be comprehensively developed as a whole way. Figure 4 shows an

example on the development of universal design for students with visual impairments in a comprehensive way.

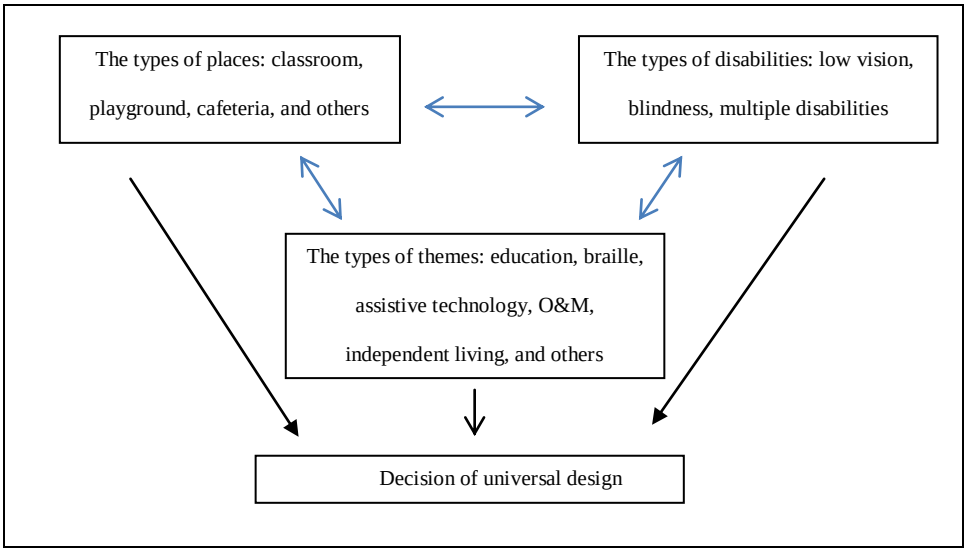

Fig. 4: A comprehensive model of universal design

4 Conclusion

Students with visual impairments can experience various difficulties while attending schools. Educators need to make efforts to reduce students' difficulties, and need to consider various factors influencing students' difficulties. This study shows that universal design can be a way for reducing difficulties that students with visual impairments can experience in their educational contexts.

This study shows that universal design for students with visual impairments needs to consider various factors such as the types of places, the types of disabilities, and the types of themes. Based on the considerations of these variables, this study displays some examples on the development of universal design for students with visual impairments.

5 Acknowledgments

This research was supported by Daegu University research grant of 2014.

References

[1] Hallahan, D.P., Kauffman, J.M., and Pullen, P.C., 2012, "Exceptional Learners: An Introduction to Special Education(12th ed.)," Upper Saddle River, NJ: Pearson Education, Inc.

[2] Han, D., Kang, M., 2014, "Application Development Guidelines for the Students with Developmental Disability based on Universal Design for Learning(UDL)," Journal of Digital Convergence, 12(10), pp. 485-491.

[3] Heward, W.L., 2013, "Exceptional Children: An Introduction to Special Education(10th ed.)," Upper Saddle River, NJ: Pearson Education, Inc.

[4] Kang, J., 2013, "A Study on Inclusive Education of Students with Visual Impairments through the Views of People with Visual Impairments," The Korean Journal of Visual Impairment, 29(4), pp. 111-130.

[5] Kang, J., 2014, "An Exploration on the Domestic Research Trend of Visual Impairment shown in "The Korean Journal of Visual Impairment"," The Korean Journal of Visual Impairment, 30(3), pp. 109-133.

[6] Kang, J., 2015, "A Study on Universal Design for the Education of Students with Disabilities," Advanced Science and Technology Letters, Vol, 87 (Art, Culture, Game, Graphics, Broadcasting and Digital Contents 2015), pp. 54-57.

[7] Kang, J., and Kim, R., 2011. "An Analysis of the Recent Study Trend of Visual Impairments," The Korean Journal of Visual Impairment, 27(4), pp. 103-133.

[8] Kim, D.I., Son, J.Y., and Youn, S.K., 2008, "Usability Testing of e-Learning applying Universal Design - Focusing on Visual, Hearing, and Physical Disabilities –," The Journal of Special Education : Theory and Practice, 9(2), pp, 97-127.

[9] Kwak, S., 2010, "The Perspective of Universal Design for Instruction and Learning Influenced on Educational Inclusion of Students with Disabilities," Korean Journal of Physical and Multiple Disabilities, 53(4), pp. 1-29.

[10] Lee, J., and Yeom, M., 2011, "The Perception and Application of Secondary School Teachers for UDL(Universal Design for Learning) in Inclusive Settings," Special Education Research, 10(1), pp, 283-304.

[11] Lee, S., and Park, E., 2011, "Education of Exceptional Children(3rd ed.)," Seoul: Hakjisa.

[12] Ministry of Education., 2013, "Special Education Annual Report," Seoul: Ministry of Education.

[13] Park, G., and Chung, J., 2014, "The Effect of Art Appreciation Activity Based on the Universal Design for Learning on Appreciation Attitude and Learning Behavior of Students in Elementary Schools for Student with Visual Impairment," The Journal of Special Education : Theory and Practice, 15(1), pp. 129-160.

[14] Park, M., 2014, "The Effects of Inclusive Physical Class Applied Universal Design for Disabilities Attitudes and Class Participation Students with and without Disabilities in a General Middle School," Korean Journal of Adapted Physical Activity, 22(3), pp. 1-13.

[15] Son, J.Y., and Kim, D.I., 2010, "A Research Review on Strategies and Effectiveness of Universal Design for Learning applied to the Education Settings," The Journal of Special Education : Theory and Practice, 11(1), pp. 385-41.