

DERIVING EDUCATION CODE SETS FROM THE *INTERNATIONAL CLASSIFICATION OF FUNCTIONING, DISABILITY AND HEALTH FOR CHILDREN AND YOUTH* (ICF-CY)

Alexis Dolor Davis

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Approved by:

Rune J. Simeonsson

Steve Knotek

Sandra Evarrs

Nianbo Dong

Pete Duquette

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ABSTRACT

Alexis Dolor Davis: Deriving Education Code Sets from the *International Classification of Functioning, Disability and Health for Children and Youth* (ICF-CY)
(Under the direction of Rune J. Simeonsson)

Classifying childhood disability is a challenge in health and education settings. Differences exist in the instruments used to document childhood disability across countries, professional disciplines, and settings. This variability compromises reliable prevalence rates, limits valid comparisons of consequences of diagnosed conditions, and reduces knowledge about functional outcomes. The lack of a universal definition of childhood disability has made it especially challenging to establish a standard classification system. The *International Classification of Functioning, Disability, and Health for Children and Youth* (ICF-CY) was endorsed by the World Health Organization in 2007 and was the first universal classification system available to document health and disability in children. The ICF-CY provides a common language and shared conceptualization of childhood disability and was designed to document the characteristics of developing children for a variety of purposes including program planning, research, and documentation of intervention outcomes (WHO, 2007). Application of the ICF-CY is important to unify data on child health status and functional characteristics; however, it is limited by the comprehensiveness of the inclusion of more than 1,600 codes.

Children have universal rights to health and education (UNICEF, 1989). Florian, et al. (2006) stated that “classifying, categorizing, and labeling children” (p. 36) are considered essential when attempting to fairly distribute education and social services for students with disabilities; however, a standard comprehensive classification of education of all students does

not currently exist. This study was conducted to enhance the utility and accessibility of the ICF-CY by asking international experts to identify essential characteristics of children and youth's functioning at three educational levels. The Delphi technique was used to obtain expert consensus to derive three education code sets for children and youth in primary education/elementary school, lower secondary education/middle school, and upper secondary education/high school. A professionally diverse panel of 73 international experts completed two Delphi rounds of online surveys to rate the most important characteristics of child functioning to include in abbreviated ICF-CY Education Code Sets for three education levels. The final code sets are intended to serve as a universal reference for minimal information to collect about child functioning in research, policy, and practice.

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LIST OF ABBREVIATIONS

DSM-5	<i>Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition</i>
FBF	Biopsychosocial Functioning Form
ICD	<i>International Classification of Diseases</i>
ICF	<i>International Classification of Functioning, Disability and Health</i>
ICF-CY	<i>International Classification of Functioning, Disability and Health Children & Youth Version</i>
ICIDH	<i>International Classification of Impairments, Disabilities, and Handicaps</i>
ISCED	<i>International Standard Classification of Education</i>
UNESCO	United Nations Educational, Scientific and Cultural Organization
WHO	World Health Organization

CHAPTER 1: INTRODUCTION AND REVIEW OF LITERATURE

Introduction

Children are developing citizens, and as such, have universal rights defined by the “United Nations Convention on the Rights of the Child” (United Nations Human Rights Office of the High Commissioner, 1989). Two central rights that are the responsibility of society are the right to health (Article 24) and the right to education (Article 28). Article 24 states that children have the right to the highest allowable health and has been the framework for providing health services for children in countries around the world. Article 28 states that children have the right to a free primary education in a school that respects their dignity and is provided in a nonviolent, orderly way. Education is valuable, and each child should be encouraged to attain the highest level of education of which he or she is capable. Article 29 describes the goals of education. “Children’s education should develop each child’s personality, talents and abilities to the fullest. It should encourage children to respect others, human rights and their own and other cultures” (UNICEF, n.d.). Additionally, education should teach children how to live peacefully and respect other people, especially their parents.

Classification systems are tools used to organize information about human rights and associated services. With respect to health, these systems have been created for documenting mortality and diseases and distributing services and resources to adults and children within a country. Each country’s perspective on child development and disability paired with their priorities for providing support and treatment to children has also led to the development of comprehensive classification systems geared toward children’s health, disabilities and

developmental progress. However, with respect to children's right to education, there are no comparable classification systems of children in educational contexts. Florian, et al. (2006) stated that "classifying, categorizing, and labeling children" (p. 36) are considered essential when attempting to fairly distribute education and social services for students with disabilities; however, a standard comprehensive classification of education of all students does not currently exist.

The need to identify a comprehensive system of classification for education builds on several considerations. First, the limitations of the existing, brief classification in education are examined. Second, an overview is made of the history of classification of health and disability and their applications. A third consideration describes the development of the ICF and the ICF-CY to document functioning, disability and health of individuals. An important priority in this regard has been the identification of means for applying the ICF-CY classification in practice with persons with disabilities. To this end, one approach that has been of growing interest is the derivation of code or core sets, a limited set of ICF-CY codes that can guide practice and assessment.

Review of Literature

International Standard Classification of Education

The *International Standard Classification of Education (ISCED)* is a universal framework of schooling that was developed by the United Nations Educational, Scientific and Cultural Organization (UNESCO) in the 1970s. The ISCED 2011 classification was adopted by the UNESCO General Conference in November 2011 (United Nations Educational, Scientific and Cultural Organization, 2012), and it provides a universal basis for defining and classifying the form and sequence of instruction. The ISCED classification also serves as an instrument to

compile and present national and international education statistics (UNESCO, 2012). In general, the sequence of instruction begins with primary or basic schooling and is followed by levels of secondary and/or post-secondary education. Table 1 presents the ISCED classification of education based on fields of education and programme levels. Simeonsson and Lee (2018) reported that the importance of preschool education (i.e., instructional programs prior to the age of entry for formal schooling) is gaining international recognition. Although school attendance is mandatory in most countries, the amount of schooling that each child receives varies.

Table 1

ISCED Fields and Programme Levels (Simeonsson & Lee, 2018, p. 6)

<i>Fields</i>	<i>Programme/ Attainment</i>	<i>Level</i>	<i>Duration</i>
0-General programmes	Early childhood	0	2 hours/day/100 days
1-Education	Primary	1	4-7 years
2-Humanities and arts	Lower secondary	2	2-5 years
3-Social sciences, business and law	Upper secondary	3	2-5 years
4-Science	Post-secondary, non- tertiary	4	½-2-3 years
5-Engineering, manufacturing and construction	Short-cycle tertiary	5	2-3 years
6-Agriculture	Bachelor/equivalent	6	3-4 years
7-Health and welfare	Master/equivalent	7	1-4 years
8-Services	Doctoral	8	3 years
	Not elsewhere classified	9	

Although ISCED provides a classification system for the expected sequence of instruction, it is limited in that it does not provide a comprehensive definition of education or a

standardized concept of its philosophy and content. The field of education thus lacks “a common language for describing population and environmental characteristics as well as for evaluating the extent to which schools are fulfilling their responsibility in addressing the universal rights of children” (Simeonsson & Lee, 2018, p. 6). Florian, et al. (2006) acknowledged that while classification (e.g., socioeconomic status, disability, English language proficiency) can ensure equal opportunities to education for different groups of students, classification in education can also be problematic because it can result in unintended consequences such as “overidentification of children from certain minority and socioeconomic groups, lowering of expectations, and the creation and maintenance of separate systems of provision” (p. 37). Despite these concerns, classification systems provide a vital way of organizing information that can be used to guide intervention.

History of WHO Classifications

International Classification of Diseases. Universal systems of classification began more than 150 years ago (Lollar, 2008). The International List of Causes of Death, the first international classification edition, was adopted by the International Statistical Institute in 1893 (World Health Organization, 2019). This classification, along with many others like it, almost solely provided cause-of-death statistics. Eventually, many countries found it necessary to prepare their own lists in the “absence of a uniform classification of diseases that could be used satisfactorily for statistics of illness” (World Health Organization, n.d.).

“WHO was entrusted with the *International Classification of Diseases* (ICD) at its creation in 1948 and published the 6th version (ICD-6)” (World Health Organization, 2019). This edition incorporated morbidity for the first time. The “ICD is the foundation for the identification of health trends and statistics globally, and the international standard for reporting diseases and

health conditions” (World Health Organization, 2019). It is the standard used for all clinical and research purposes and defines health conditions in a comprehensive, hierarchical list. This allows for “easy storage, retrieval and analysis of health information for evidenced-based decision-making; sharing and comparing health information between hospitals, regions, settings and countries; and data comparisons in the same location across different time periods” (World Health Organization, 2019). There are many uses of the ICD such as the ability to monitor the incidence and prevalence of diseases and the ability to keep track of safety guidelines.

Health care providers in the United States continue to use the ICD as its standard classification system of diseases and disorders, and health insurance funding is dependent upon the assignment of an ICD code (O’Malley, et al., 2005).

The WHO Nomenclature Regulations, adopted in 1967, stipulated that Member States use the most current ICD revision for mortality and morbidity statistics. The ICD has been revised and published in a series of editions to reflect advances in health and medical science over time. (World Health Organization, 2019)

The 11th revision (ICD-11) was released in June 2018 and, following endorsement, Member States will begin reporting using it on January 1, 2022 (World Health Organization, 2019). The ICD classifies diseases based on the cause of the disease, but does not include functional impairments of those diseases.

In 1980, WHO published the *International Classification of Impairments, Disabilities, and Handicaps* (ICIDH) as a companion document to the ICD to address the need to better understand the consequences (i.e., impairments, disabilities, and handicaps) of injury and disease. Figure 1 represents the ICIDH integrated framework. Each of the three major codes includes a taxonomic listing of chapters. The Impairment Code includes “1,009 entries intended to document any loss or abnormality of psychological, physiological, or anatomical structure or function” (Simeonsson, Lollar, Hollowell, & Adams, 2000, p. 114).

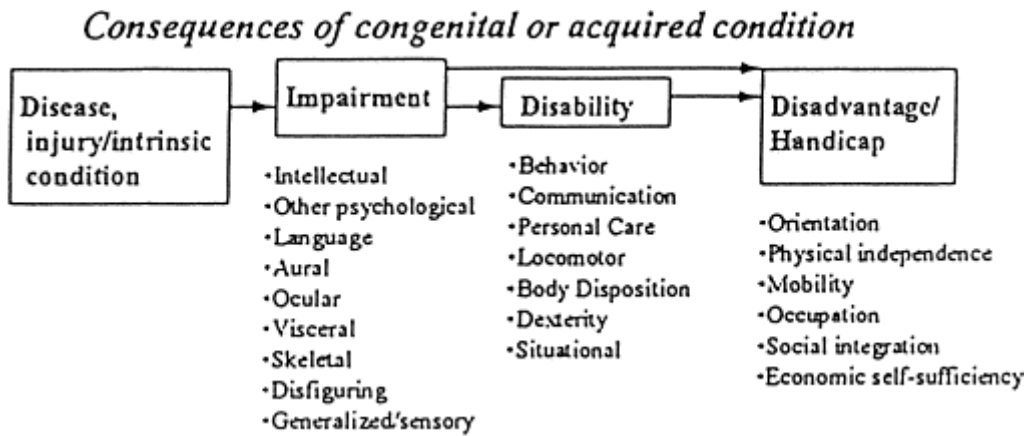


Figure 1. ICIDH framework (World Health Organization, 1980)

The linear nature of consequences of the 1980 ICIDH model received major criticism and as a result the classification was not widely used. Simeonsson, Lollar, Hollowell, and Adams (2000) suggested a revision to the model that would take into account “reverse effects reflecting sequelae and secondary conditions” (p. 116). Florian, et al. (2006) suggested that as the conceptualization of disability developed overtime, new international classification systems were created and challenged the traditional ways people thought about categories and labels.

The *International Classification of Functioning, Disability and Health*

The World Health Assembly approved the *International Classification of Functioning, Disability and Health* (ICF) in 2001. The ICF was developed as a companion classification to the ICD, and it classifies functioning and disability. “The aim of the ICF is to provide a unified and standard framework and language for the description of health states” (Lollar & Simeonsson, 2005, p. 324). The ICF focuses on the components of health, leaving the traditional disease focused, deficit approach in medicine behind. In addition, the ICF framework assumes that the experience of disability is common, and it is not necessarily synonymous with illness. “The language used is value neutral and cause neutral” (Lollar & Simeonsson, 2005, p. 324). The conceptual framework is based on a model of interactions as presented in Figure 2. Earlier

models approached disability with the assumption that it led to impairment. This approach resulted in limitations and disadvantages for those individuals with disabilities. Also, the ICF highlights the role the environment plays in the manifestation of disability (Lollar & Simeonsson, 2005).

The bidirectional arrows in the ICF conceptual model in Figure 2 represent the ongoing influence that environment and personal factors (e.g., age, education, socioeconomic status) have on body functions and structures, activities, and participation. Of note, personal factors do not have corresponding codes for classification (Lollar & Simeonsson, 2005).

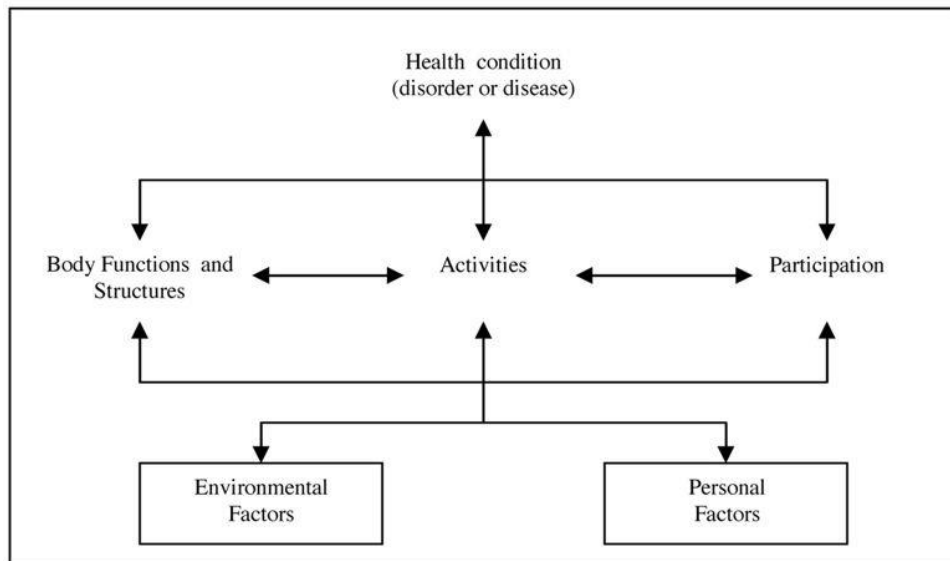


Figure 2. Interactions between the components of ICF (World Health Organization, 2007, p. 17)

The ICF has two parts, and each part has two components. The first part, Functioning and Disability, is comprised of (a) Body Functions and Structures and (b) Activities and Participation. The second part, Contextual Factors, is comprised of (c) Environmental Factors and (d) Personal Factors. Each of the four components can be expressed in both positive and negative terms (World Health Organization, 2007). The following table (Table 2) provides an overview of the ICF’s components, domains, and categories.

Table 2

An Overview of ICF (World Health Organization, 2007, p. 10)

	Part 1: Functioning and Disability		Part 2: Contextual Factors	
Components	Body Functions and Structures	Activities and Participation	Environmental Factors	Personal Factors
Domains	Body functions Body structures	Life areas (tasks, actions)	External influences on functioning and disability	Internal influences on functioning and disability
Constructs	Change in body functions (physiological) Change in body structures (anatomical)	Capacity Executing tasks in a standard environment Performance Executing tasks in the current environment	Facilitating or hindering impact of features of the physical, social, and attitudinal world	Impact of attributes of the person
Positive aspect	Functional and structural integrity	Activities Participation	Facilitators	not applicable
	Functioning			
Negative aspect	Impairment	Activity limitation Participation restriction	Barriers/hindrances	not applicable
	Disability			

The ICF includes more than 1,400 codes which are identified by letters and numbers and represent increasingly detailed categories. Specifically, the ICF codes begin with a letter to identify the domain (i.e., b-body functions, s-body structures, d-activities and participation, and e-environmental factors). The letter is followed by numbers that represent chapters (first level), categories (second level), and subcategories (third and fourth levels). Qualifiers from 0 to 4 can be applied to the categories to denote severity of a problem, limitation, or restriction for functioning (i.e., 0=no problem, 1=mild, 2=moderate, 3=severe, 4=complete) (WHO, 2007).

Classification of Childhood Disability

All children have the right to the highest attainable state of health (Article 24), and children with disabilities have the additional right to special care and support that will enable them to live full lives (Article 23) (United Nations Human Rights Office of the High Commissioner, 1989). According to the United Nation Children’s Fund (UNICEF, 2013), one widely used estimate in circulation since 2004, estimated that 1 in 20 children worldwide aged 14 or younger live with a moderate or severe disability of some kind. Global estimates of the overall prevalence rates of children with disabilities like this one are speculative. Reliable comparisons of functional consequences of disability among different countries is lacking. Challenges regarding exact estimates center around the varying definitions of disability by place and time, criteria used to diagnose disabilities, study designs, age of children studied, and analysis of data.

The 2017 National Survey of Children’s Health reported that 36.4% of children aged 0 to 17 have one or more health conditions (e.g., allergies, asthma, anxiety, diabetes, depression, Down Syndrome, learning disability, developmental delay, ADHD, ASD), 40.2% of whom their daily activities are at least moderately affected some of the time and 25.4% of whom have one or more functional difficulties (e.g., breathing, using hands, walking, hearing, vision). This survey also revealed that 18.2% of children aged 0 to 17 have special health care needs (e.g., prescription medication, specialized therapy) (Child and Adolescent Health Measurement Initiative).

The United States continues to classify childhood disability by problems and symptoms which determine disability diagnoses. The *International Classification of Diseases* (ICD-10) and the *Diagnostic and Statistical Manual of Mental Disorders, Fifth Edition* (DSM-5) (2013)

provide the diagnostic criteria used nationwide by health care professionals. The DSM's purpose and use is described below.

The *Diagnostic and Statistical Manual of Mental Disorders* (DSM) is the handbook used by health care professionals in the United States and much of the world as the authoritative guide to the diagnosis of mental disorders. *DSM* contains descriptions, symptoms, and other criteria for diagnosing mental disorders. It provides a common language for clinicians to communicate about their patients and establishes consistent and reliable diagnoses that can be used in the research of mental disorders. It also provides a common language for researchers to study the criteria for potential future revisions and to aid in the development of medications and other interventions. (American Psychiatric Association, 2018)

Most statistical data on disability reported in the United States and internationally are not classified on the basis of a standard classification of child health and functioning. Diagnostic and categorical definitions of disability were developed within a medical model of impairment where differences were conceptualized in terms of disease or deficit (Florian, et al., 2006). Childhood disability has been viewed as a static problem defined by the manifestation of a health condition that resulted in a physical or mental impairment.

Msall and Hogan (2007) reported that research in childhood disability has not been adequate despite the major impact it has on child health, family life, and economics. Several reasons that research is lacking in this area include:

the difficulty in counting children when there is limited public health infrastructure or community-based preventive pediatric systems. In addition, this situation is compounded if there are gaps in educational access and no formal arrangements exist for collaboration between health and education for evaluating children who are blind, deaf, mobility challenged, unable to follow directions, or unable to learn to read and calculate. (Msall & Hogan, 2007, p. 182-183)

ICF-CY: A health classification for children and youth. Given the need for formal systems for collaboration between health and education (Msall and Hogan, 2007), the ICF offers a system to generate standard documentation for assessment and evaluation. Although the publication of the ICF provided an important advancement in the classification of human

functioning, health and disability, it did not adequately capture functional characteristics specific to infants, toddlers, children, and adolescents (Lollar & Simeonsson, 2005). Lollar and Simeonsson (2005) stated that “manifestations of disability in children are different in nature, intensity, and consequences from those of adults” (p. 325). Lollar (2008) suggested that the ability to capture disability or health status for a child is a dynamic, complicated process given that development is rapid and very much influenced by ongoing interactions with people and environmental factors that can promote or impede development. In 2001, WHO formed an international work group, co-led by Dr. Rune Simeonsson, a psychologist from the University of North Carolina, and Dr. Matilde Leonardi, a neurologist from the Italian National Neurological Institute to develop a children and youth version of the ICF.

The *International Classification of Functioning, Disability and Health for Children and Youth* (ICF-CY) expanded the content of the ICF and was published in 2007. It is the first standard, international taxonomy of health and disability created exclusively for children and youth. The ICF-CY does not provide a diagnosis for a child, but instead describes the severity of the limitations of the child’s functioning. Additionally, the ICF-CY identifies the environmental factors that influence the child’s functioning (WHO, 2007). The ICF-CY contains over 1,600 codes, and the coding system is consistent with that of the ICF.

Applications of the ICF-CY. Although the ICD-10 and the classification systems that came before it have been used to record conditions underlying childhood disability, “the publication of the ICF offers the opportunity for the complementary use of both classifications to document medical conditions and functional aspects in a comprehensive approach” (Simeonsson, Scarborough, & Hebbeler, 2006, p. 366). The ICF-CY provides a framework for the description

of children's (i.e., age 0-18) functioning, on a continuum. Three ways in which the ICF-CY have been implemented are:

(1) as a theoretical model that helps to rethink disability and special needs; (2) as a model that can be applied to support policy decision making about service provisions for disabilities and special needs; (3) and as a tool to support the work of professionals who directly intervene with children with disabilities and special needs. (Castro & Palikara, 2018, p. 2)

These professionals include clinicians, educators, policy-makers, family members, consumers, and researchers. The ICF-CY will continue to be used as a statistical tool in the collection and recording of data; a research tool to measure outcomes, quality of life, or environmental factors; a clinical tool in needs assessment; a social policy tool in policy design and implementation; and an educational tool in curriculum design (WHO, 2007).

Development and testing of the ICF-CY involved people from a broad range of backgrounds and disciplines. As a result, it has a wide range of potential applications in a broad range of sectors (e.g., health, education, social policy). Simeonsson and Lee (2018) suggested that the descriptive focus of the ICF-CY offers a common language that can be used to document the characteristics of schools and functioning of students, and as a result, aid in the advancement of policy and practice in the field of education. A useful application of the ICF-CY could be to document student performance and school engagement.

For special education specifically, the ICF-CY can bridge the language gap between “disability-focused determinants and education-related knowledge” (Simeonsson & Lee, 2018, p. 9). A reduction in discipline-specific language would support those professionals who work with children in the school setting (e.g., educators, school nurses, psychologists) as they identify the interventions and environmental supports needed by each individual child. A common language would also encourage a holistic and integrated view of the child (Simeonsson & Lee, 2018).

Additionally, the ICF-CY could be used when working with parents of children with disability. Assessment should be directed towards a more robust description of the child's functioning and participation and be less about the child's diagnosis, as a diagnosis can present in a variety of ways.

ICF and ICF-CY Core or Code Sets

The ICF and the ICF-CY contain more than 1,400 and 1,600 codes respectively. While the comprehensiveness of the system is noted as a strength, it is also a major challenge to its practical usage (Stier-Jarmer, Cieza, Borchers, & Stucki, 2009). In daily practice, professionals only need a fraction of the categories found in the ICF. To aid the practical application of the ICF, a smaller set of selected codes, known as "Core Sets", were created to serve as an efficient source of codes for documentation of assessment and intervention.

An ICF Core Set (ICF-CS) is a selection of essential categories from the full ICF classification that are considered most relevant for describing the functioning of a person with a specific health condition or in a specific healthcare. ICF-CS can serve as a minimal standard for the assessment and reporting of functioning and health in clinical practice and studies. (Selb, et al., 2015, p. 105)

In 2015, Selb, et al. identified the availability of 34 ICF-CSs. Each ICF-CS has comprehensive (i.e., comprehensive and exhaustive description of functioning) and brief (i.e., most essential categories that can serve as a minimal standard for describing functioning) versions. ICF-CSs are developed through a scientific, multi-method process. The preparatory phase includes an empirical multicenter study, a systematic literature review, a qualitative study, and an expert survey. Next, Phase I includes an international ICF consensus conference and the first version of the ICF-CS. Finally, Phase II is the implementation of the first version of the ICF-CS. A variety of core sets have been developed, but almost all of them have focused on chronic disease and disability conditions in adults and children.

Need for code set for education. The ICF-CY was developed as an inter-disciplinary tool with widespread applications across health-related disciplines, but its potential utility for education is just emerging (Castro & Palikara, 2018). With the multidimensional scope of the ICF-CY, the application of its framework and codes can be useful for education. Most applications of the ICF-CY up to this point have been focused on diagnostic issues. Specifically, use of the ICF-CY in education has been largely oriented to special education disability [e.g., ADHD (de Schipper, et al., 2015)]. There is a need for a code set in education that is not focused on diagnostic issues, but is geared toward broader applications of how children and youth function within school settings. This study will examine the potential utility of the ICF-CY within the field of education beyond applications related to special education. The term “code set” will be used in the proposed study in place of “core set” in that the identified codes are not core to a diagnosis, but will define a set of codes that is important for defining the characteristics of students and their school environment.

Study Purpose

The purpose of this study was to enhance the utility of the ICF-CY for research, policy, and practice in education application by deriving three ICF-CY education code sets representing essential dimensions of child functioning based on consensus from an international panel of multidisciplinary experts. Professionals from major regions of the world were invited to participate in a three-round Delphi procedure, ranking ICF-CY codes for three ISCED educational levels. The results of the Delphi procedure served as the basis for developing code sets for children in (a) primary education/elementary school, (b) lower secondary education/middle school, and (c) upper secondary education/high school. The aim was to

develop brief code sets that are applicable within a global and multidisciplinary context to document child functioning within various educational contexts.

The ICF-CY code sets were expected to represent the most relevant dimensions of functioning for children and youth according to the national and international expert participants. Condensing the number of codes and organizing them within ISCED educational levels would streamline the use and improve the feasibility of the code sets. The results from the study were anticipated to promote the acceptance of the ICF-CY in education and facilitate applications of the ICF-CY for practice and policy.

CHAPTER 2: METHOD

Study Design

The Method chapter is divided into three sections. The first section describes the study design and measures that were used in the study. The second section describes the data collection process. The third section presents the data analysis procedures that were used in the study.

Data for this study were collected using the Delphi survey technique. Norman Dalkey and Olaf Helmer developed the Delphi technique in the 1950s at the RAND Corporation as a way to project technological trends for the United States Air Force (Puig & Adams, 2018). Today, the RAND Corporation has thousands of international clients and stakeholders for whom they have generated ideas and solutions for using research and analysis. As a result, they are able to help improve policy and decision making world-wide (RAND Corporation). The Delphi technique has since been used in many fields including, but not limited to, education, psychology, health care, and business (Puig & Adams, 2018).

The Delphi technique utilizes an iterative, multistage process to facilitate group consensus among experts, typically who are regionally or geographically apart, on a particular subject (Hasson, Keeney, & McKenna, 2000). As participants anonymously express their opinions on a series of questionnaires or surveys, agreement can emerge with minimal influence from other participants. The Delphi technique has been criticized for several reasons. In general, the Delphi technique lacks universally agreed upon guidelines for use. According to Hasson, Keeney, and McKenna (2000), the nature of the problem should be taken into consideration, as

the Delphi technique is only appropriate for decisions that lend themselves to the use of group involvement. In addition, there is controversy over how to identify a professional as an expert and how to select experts for a panel. “The claim that one group represents valid expert opinion has been criticized as scientifically untenable and overstated” (Hasson, Keeney, & McKenna, 2000, p. 1010). Another criticism is that the participants of a Delphi study are usually committed to the process because they are interested in and/or involved with the question being examined; therefore, it is challenging to find completely impartial experts that will provide information that reflects current knowledge and/or perceptions (Hasson, Keeney, & McKenna). Additionally, there is no universally agreed upon proportion that represents what the target level of consensus should be.

Hasson, Keeney, and McKenna (2000) provided researchers undertaking the Delphi technique with a checklist of limitations to consider in order to ensure its proper use and increase rigor. These common problems presented in the literature were taken into careful consideration during the study design process to prevent or reduce bias and strengthen reliability. Although the Delphi technique is void of official guidelines, the data gathering process itself generally includes four phases:

(1) expert panel members are selected to respond to an open-ended questionnaire, informed by extensive literature review, to gather their opinions about a specific topic or area of focus, (2) the input from each content expert is recorded to grasp group perceptions about the topic, (3) researchers further investigate expert views via a follow-up survey, and (4) researchers review all information after the experts have analyzed preliminary data and provided input. The time span between waves can range from 2 weeks to 1 month, depending on the number of statements provided in the initial review document. (Puig & Adams, 2018, p. 2)

The Delphi technique was selected as an appropriate research method for this study for several reasons. First, the design of this study follows a process similar to that used to develop ICF Core Sets in earlier studies for adult medical conditions and diseases. That process involves

a literature review, identification of an initial set of ICF-CY codes for the survey, and multiple round expert responses using the Delphi technique. Thus, a thorough review of the ICF Core Set research was conducted to guide the design and implementation procedures that was used in the current study.

Second, this research method enabled participation of a large number of geographically dispersed individuals at a time convenient to each participant. Third, this technique is an inexpensive method that allowed efficient recruitment of experts located in various countries. Finally, an online format was used to collect the data because it allowed the immediate analysis of data required each wave of data collection. The use of a flexible, affordable, technology forward approach aided in the achievement of the goal of obtaining expert consensus of education code sets from national and international stakeholders who are the intended consumers of the WHO ICF-CY.

Survey Instrument

A Delphi survey technique was used to derive three code sets corresponding to three of the ISCED program levels: level 1 primary education/elementary school, level 2 lower secondary education/middle school, and level 3 upper secondary education/high school. Background information and previous experience with the ICF-CY was obtained in the initial questionnaire. Participants were asked to respond to an online survey in three successive rounds to identify essential indicators of child functioning and disability from the WHO ICF-CY as they relate to education. Participants ranked items from the Activities and Participation, Environmental Factors, and Body Functions domains of the ICF-CY. Three rounds of questionnaires were administered in order to build consensus. The second surveys' designs were based on the results from the survey that preceded it. The number of items ranked were reduced on the second

survey. The second survey presented the three derived item sets that were endorsed by the participants.

Qualtrics, an established web-based company, was used to collect data. Qualtrics offers data security, participant confidentiality, and links participation status with email addresses which allowed for easy management of follow-up and response rate. Original surveys were designed for each round of data collection. The questionnaire content for the second round was determined after an analysis of participant responses to the previous survey. The following sections describe the design of each questionnaire by data collection round. Each survey was reviewed by the advisor of this dissertation, who co-chaired the WHO ICF-CY design workgroup and is an international expert in the field of child psychology. The Qualtrics surveys can be found in Appendix A.

Round one survey design. The first online survey incorporated the collection of background information about the study participants. Participants were asked to provide information regarding their professional disciplines, nature of their work, years of experience, educational attainment, primary country of work, and familiarity with the ICF and/or ICF-CY. This information provided documentation of the national and professional diversity of the study participants.

The ultimate goal of this study was to derive reduced item ICF-CY code sets that represent universal indicators of key dimensions of education and expected child functioning at three different ISCED levels (i.e., primary education/elementary school, lower secondary education/middle school, upper secondary education/high school) from the existing ICF-CY codes. For the first survey, items were organized under ICF-CY domains (i.e., Activities and Participation, Environmental Factors, and Body Functions) rather than by proposed ISCED

levels to allow participants to decide whether or not each item was applicable to each educational level.

Items were selected for inclusion on the online survey based on a review of relevant literature on students in educational settings and earlier studies deriving ICF or ICF-CY core or code sets defining child characteristics and functioning. The first survey included 82 second and third level items from the ICF-CY Activities and Participation, Environmental Factors, and Body Functions domains, and participants were asked to examine each of these for possible inclusion in the three education code sets. The items were separated by domain and organized according to the structure and categories of the ICF-CY. Participants were asked to indicate for which of the three educational levels, if any, the items would be appropriate to include in the code sets in a checklist format. This checklist design minimized respondent burden.

Round two survey design. Items reaching a consensus of at least 60% by participants were retained for the second Delphi round. Participants also had the opportunity via an open-ended question on the survey to suggest items that were dropped or excluded. The survey items for the second round were arranged by ISCED level, rather than ICF-CY domain. Participants rated each item under the specified ISCED level as “Yes” essential to include or “No” not essential to include in the ICF-CY universal, minimal-item, education code sets for reference in research, policy, or application with children.

Procedures

The key aim of this study was to derive universal code sets for education based on the ICF-CY classification system. The development of the code sets relied on the input of an international expert group, so that the resulting code sets are applicable across countries in a

variety of educational practice settings. Central to the attainment of this goal is recruitment of participants and data collection procedures as described below.

Participants. Proper panel composition increased the credibility of the consensus technique used in this study (Campbell, Shield, Rogers, & Gask, 2004). There is no set criterion for determining a Delphi sample size. “As in other survey techniques, this decision is often based on funding, logistics and rigorous inclusion and exclusion criteria” (Keeney, Hasson, & McKenna, 2006, p. 209). This study aimed to build a panel of at least 100 professionals and consumers of the ICF-CY in order to represent the span of children’s levels of education across many countries. The participants in this study were stakeholders in education (e.g., teachers, administrators, other school professionals, parents, and higher education faculty) as these individuals represent the audience for whom these education code sets are intended. For this study, the panel of experts were recruited based on professional roles in educational settings. The main exclusion criterion for participants in this study was lack of ability to read English, as the survey invitation, consent, and questionnaires were only provided in English.

Recruited individuals were invited to participate in this study via email. Invitation emails can be found in Appendix B. Internet access and an email account were necessary participant eligibility requirements as this was the mode of contact for study recruitment (i.e., study invitation with description of the process and informed consent procedures) and participation (i.e., surveys). Efforts were made to recruit professionals from a variety of fields, who represent a range of cultures, and who may already be familiar with the WHO ICF-CY.

The initial participant list was formed by suggested contacts with prior engagement with and demonstrated interest in the ICF-CY as identified by the dissertation advisor. The dissertation advisor provided contact information for individuals who indicated an interest in

participating in the study. In addition, the author reached out to known contacts in the field of education. In an effort to improve panelist recruitment and retention over Delphi rounds, recruited participants were encouraged to nominate other experts in the field of education (i.e., “snowballing”) (Rowe & Wright, 2011, p. 1489). The nominated experts were informed of the study invitation via email and invited to participate in the study. The author also researched ministries or departments of education around the world. Ministries of education are national or subnational government agencies politically responsible for education. If a country’s website was in English and had at least one contact email, the author sent the invitation to that ministry or department of education.

The official study invitation explained the purpose and process of the study. According to procedures submitted for approval by the University of North Carolina at Chapel Hill IRB, all participants were asked to reply to the official detailed invitation indicating that they were willing to participate in the study, and thus providing the author with informed consent. Recruited participants received a description of the study, assurance of confidentiality, and information regarding potential risks and benefits to participating. Participants were also offered a copy of the final education code sets for use in practice, research, and policy endeavors. Those individuals who preferred not to receive future contact were removed from the email distribution list.

After responding to the email invitation, each participant received a link via email which allowed her or him to access and complete the first online survey. Each person was assigned an individual code connected to her or his email address. Follow-up reminders were individualized and sent as needed between data collection rounds.

Panel attrition is one limitation that has been addressed in the Delphi technique literature (Puig & Adams, 2018). Keeney, Hasson, and McKenna (2006) suggested that researchers should aim to make the participants feel like partners in the study. Ensuring that the participants have some interest or investment in the topic will also enhance responses in the rounds. Keeney, et al. (2006) recommended the follow strategies to enhance response rates: use the initial contact to build rapport [McKenna (1994) found that participants appreciated the “personal touch” (p. 1224) of an initial face-to face interview], develop and maintain a relationship, appreciate the respondent’s valuable information, provide information on the implementation of the study, and gain the commitment of each participant. In an effort to maintain the panel of experts, the anticipated timeline of the study was disclosed in the invitation email and any questions that participants had were answered in a timely manner. Additionally, email reminders were sent individually to non-responders and partial responders to encourage completion.

Data Collection and Analysis

Following receipt of all responses to the initial survey, responses across all participants were tabulated to identify the items that were identified as “essential” and retained for the second round. The data was entered into the second survey and distributed to the participants in the expert group. The process of tabulation of items in the first round was repeated in the second round. Items rated as “essential” in the second round (i.e., items endorsed by at least 75% of participants) were adopted as the final code sets corresponding to each of the three ISCED levels.

In this Delphi technique, the information obtained from experts was analyzed between each round. Analysis of data occurred after each wave of data collection. Descriptive statistics and percent agreement on each item was obtained. Final code sets were defined by codes

corresponding to each of the three ISCED levels. The code sets were provided to members of the expert panel for their information and use.

CHAPTER 3: RESULTS

The initial plan for this Delphi study was to use three rounds of online surveys; however, based on the results of the first round, it was decided that two rounds would be sufficient to obtain consensus. The following results are based on two rounds of data collection. The Delphi technique proved to be a valuable and efficient method for obtaining expert consensus on essential ICF-CY items by educational level. Participant responses yielded three unique education level based item sets that were approximately two-thirds of the initial items presented for each educational level. Endorsement rates by participants of the proposed education code set items were high (72% to 100%), which suggests that the iterative process used in the study to achieve consensus from a diverse group of experts was an effective method that enabled the successful achievement of the broad study goals. The Results chapter begins with an overview of the response rate and participant retention. The sections that follow present findings from each round of data collection. The chapter concludes with ICF-CY domain representation across the three code sets. The derived ICF-CY Education Code Sets can be found in Appendix C.

Response Rates

Overall, a total of 73 individuals participated in the study. The 62 individuals who completed the first survey were invited to participate in round two. In addition, three individuals who were invited in round one but did not respond were invited again in round two per their own requests, and they each completed the survey. Finally, 14 new individuals were invited to participate in round two, and 11 of those individuals completed the survey. Response rates for the study started at 82% and increased to 98% in the second round. In the second round, 79% (49

out of 62) of the original participants completed the survey. Response rates are presented in Table 3.

Table 3

Response Rates

	Invited	Opted Out	No Response	Consented	Responded	Response Rate
Round 1	265	1	189	76	62	82%
Round 2	79*	0	18	61**	60**	98%
*14 of these potential participants were not invited in Round 1.						
**11 of these participants did not participate in Round 1.						

Efforts to maintain participation included email reminders to complete surveys by indicated deadlines throughout the duration of the surveys. Additionally, the survey deadlines were extended on several occasions. The results chapter concludes with tables that display the three derived education code sets.

Summary of Survey One Results

The first Qualtrics survey included background information about the study participants and their ratings on the appropriateness of the inclusion of 82 second and third level items from the ICF-CY Activities and Participation, Environmental Factors, and Body Functions domains in education level based reduced item code sets. Information regarding the characteristics of the study participants is presented first and followed by an analysis of participant ratings of individual ICF-CY items.

Characteristics of Participants

Involving culturally and professionally diverse participants was imperative given the study purpose and research design. Individuals were recruited to reflect a range of professional disciplines, working in a variety of settings, and residing in various countries. Participants were also expected to have high levels of education and professional experience to qualify as being

knowledgeable and informed with regard to functional characteristics of children at various education levels. Therefore, a series of questions on the first survey asked participants to share background information about countries where they have worked, level of education, professional field, and years of experience. The composition goals for the panel of experts were met as the panel included highly experienced and educated professionals from various professional disciplines and many major world regions.

Fifty-eight out of 62 participants completed all demographic questions on the first survey. Eleven new participants participated in round two. A separate background information survey was emailed to those participants. The background information survey was an exact replica of the demographic questions included on the first survey. Ten out of 11 new participants in the second round completed the demographic questions survey. Out of the 72 participants, 68 answered all demographic questions and all 72 participants responded to at least two of the questions. Responses to demographic questions from both rounds of the Qualtrics survey are summarized in the next section according to the following dimensions: global representation of the experts, level of education, nature of participant work, and professional experience.

Global representation. Professionals from 15 different countries participated in the study (Table 4). In addition, nearly half of the expert panel indicated that they were currently involved in work or had worked in at least one other country to contribute to international research, program development, teaching, and/or practice (n=33, 46%). Participants reported related work experience within 29 additional countries, across eight world regions (Table 5). Thus, in total, study participants reported professional involvement in over 44 different countries indicating an expert panel with considerable experience working within a broad range of cultures.

Table 4

Participant Representation by Primary National Residency

Primary National Residency	N	Percentage
United States of America	39	57%
China	5	7%
Portugal	3	4%
Taiwan	3	4%
Turkey	3	4%
United Kingdom	3	4%
Canada	2	3%
Japan	2	3%
Singapore	2	3%
Armenia	1	1%
Austria	1	1%
Colombia	1	1%
Finland	1	1%
Lithuania	1	1%
Scotland	1	1%
TOTAL	68	100%

Table 5

Participant Involvement with Work in Other World Regions

Region	N	Percentage
Africa	6	11%
Asia	11	20%
Central America, South America, & Caribbean	8	15%
Europe	15	28%
North America	12	22%
Oceania	2	4%
TOTAL	54	100%

Participants specified the following additional countries where they worked: Argentina (n=2), Australia (n=1), Brazil (n=1), Bulgaria (n=1), Chile (n=1), Costa Rica (n=1), England (n=3), Eritrea (n=1), France (n=1), Germany (n=2), Italy (n=2), Kenya (n=3), Korea (n=1), Kosovo (n=1), Kyrgyz Republic (n=1), Luxembourg (n=1), Macedonia (n=1), Mexico (n=1),

Panama (n=1), Peru (n=1), Poland (n=1), Russia (n=4), Samoa Islands (n=1), South Africa (n=2), Spain (n=1), Sweden (n=6), Tanzania (n=1), Uruguay (n=1), and Vietnam (n=1).

Education. Ratings of ICF-CY items were intended to capture the informed opinions of knowledgeable professionals. In this regard, the vast majority of study participants were highly educated. Most of the participants had a graduate degree (94%). Fifty percent of the participants had a masters or specialist degree and 44% had a PhD, MD, or JD.

Professional diversity. Twenty-two different professions were represented including psychologist, educator, child development specialist, administrator, medical doctor/physician, physical therapist, occupational therapist, audiologist, and social worker (Table 6). One fifth of the experts reported “Other” as their professional field [i.e., graduate student/candidate (n=3), counselor (n=2), professor and/or researcher (n=4), early childhood faculty (n=1), entrepreneur (n=1), teacher educator (n=1), administrator in higher education (n=1), programme manager (n=1)]. Disciplines that appeared to have higher representation by the participants included psychology and education (62%). Of the 29 participants who reported educator as their professional field, four (14%) of those were educators in post-secondary settings.

Table 6

Participants’ Professional Fields

Professional Field	N	Percentage
Psychologist	15	21%
Educator (primary education/elementary school)	8	11%
Educator (special education)	7	10%
Educator (lower secondary education/middle school)	6	8%
Child Development Specialist	4	6%
Administrator	3	4%
Educator (early childhood)	3	4%
Medical Doctor/Physician	3	4%
Physical Therapist	3	4%
Occupational Therapist	2	3%
Audiologist	1	1%

Educator (upper secondary education/high school)	1	1%
Social Worker	1	1%
Other (e.g., counselor, professor, researcher)	14	20%
TOTAL	71	100%

In addition, participants were asked to report the current nature of their work (Table 7). Responses revealed a variety of professional activities. Of the participants who selected “Other,” two participants listed a combination of natures of work (i.e., teaching and administration, teaching and research). Therefore, 61% percent of the participants reported involvement in teaching and/or research as a component of their current position.

Table 7

Nature of Participants’ Current Work

Nature of Work	N	Percentage
Teaching	24	34%
Research	17	24%
Clinical Services	8	11%
Graduate Study	7	10%
Administration & Policy Making	5	4%
Other (e.g., counseling, librarian, mental health professional/school team member)	10	17%
TOTAL	71	100%

Professional experience. Participants were recruited as knowledgeable experts with relevant experience; therefore, a substantial length of time working in their professional field was assumed to strengthen the credibility of the findings. The majority of participants reported working 10 years or more in their respective professional field (61%). One third of the participants indicated having at least 20 years of professional work experience (33%). Less than one third (31%) of the participants had five years or less of professional experience.

Familiarity with ICF-CY. Participants were asked to report their familiarity and prior involvement with the ICF-CY before rating items for the code sets. The reported level of familiarity with the ICF-CY varied. One third of participants (33%) indicated that they were not at all familiar with the ICF-CY, 25% indicated that they were somewhat familiar (e.g., have some general knowledge about ICF-CY), 8% indicated that they were familiar (e.g., know content and understand purpose and use), 8% indicated that they were very familiar (e.g., have reviewed literature, explored application for use in practice or to include in research), and 25% indicated that they were extremely familiar (e.g., have applied in research, used in practice, taught, and/or participated in development and construction of the ICF-CY). Regarding prior involvement with the ICF-CY, 45% of participants reported having used the ICF-CY in research, practice, and/or for program or policy development, and 17% of participants indicated involvement in the development or review of the ICF-CY.

ICF-CY Item Ratings for Survey One

In the first round of the Delphi survey, participants were asked to indicate ICF-CY items they thought were essential for inclusion in code sets for three levels of education. The first round survey presented 82 second and third level items from three domains of the ICF-CY (Activity and Participation, Environmental Factors, and Body Functions). Participants were asked to consider all 82 items for each of the three educational levels (i.e., primary education/elementary school, lower secondary education/middle school, upper secondary education/high school) and indicate if the item was appropriate and essential to include in the code sets. The items were defined by ICF-CY domains representing Activity and Participation, Environmental Factors, and Body Functions. Items reaching a consensus of at least 60% by participants were retained for the second Delphi round.

The percentage of items on which consensus was reached varied across the three educational levels and are presented in Table 8. The number of ICF-CY items rated as essential by participants for the lower secondary education/middle school code set was 65 (79%) as shown in the table. Approximately two thirds of the items were rated as essential for the code set for the primary education/elementary school (57) and for the upper secondary education/high school (53) (70% and 65% respectively). The number of items rated across each ICF-CY domain for each educational level are presented in Table 8. Items not endorsed at the 60% limit were not included in the second survey.

Table 8

Number and Percentage of Items Rated as Essential in Round One by Educational Level

	Activities and Participation (38 items)	Environmental Factors (22 items)	Body Functions (22 items)	Total Survey Items (82)
Primary education/elementary school	27 (71%)	15 (68%)	15 (68%)	57 (70%)
Lower secondary education/middle school	30 (79%)	16 (73%)	19 (86%)	65 (79%)
Upper secondary education/high school	25 (66%)	11 (50%)	17 (77%)	53 (65%)

The original 82 items were unevenly distributed across domains in the first survey. Thirty-eight items were presented for the Activities and Participation domain, 22 for Environmental Factors, and 22 for Body Functions. A comparison of items on which consensus was reached for each domain across all three educational levels revealed the highest retention for Body Functions items. The percentage of Body Function items endorsed by participants were as follows: 68% for primary education/elementary school, 86% for lower secondary

education/middle school, and 77% for upper secondary education/high school. The percentage of Activity and Participation items endorsed were as follows: 71% for primary education/elementary school, 79% for lower secondary education/middle school, and 66% for upper secondary education/high school. The percentage of Environmental Factor items endorsed were as follows: 68% for primary education/elementary school, 73% for lower secondary education/middle school, and 50% for upper secondary education/high school.

In addition to rating survey items, participants had the opportunity to respond to an open-ended question requesting any other items the participants thought should have been included. Four additional items were suggested. Those items were transportation, recreation and leisure, going to school and back home by himself/herself, and having lunch with friends and were included in the second survey.

Summary of Survey Two Results

In the second Delphi round of data collection, the survey included items on which consensus had been reached by at least 60% of study participants in round one. Participants were asked to review the retained items from survey one and decide whether or not each item should be included as part of the ICF-CY universal minimal code sets, representing the most relevant dimensions of functioning for children and youth at each educational level. Items were first arranged by educational level and then by ICF-CY domain, rather than only by ICF-CY domain as presented in the first survey in that endorsed items varied by educational level. Items were endorsed as either “Yes” should be included or “No” should not be included in the final ICF-CY education code set at each educational level.

A high level of agreement among study participants was reached regarding items essential to include in the education code sets (72% to 100%). Using a consensus rate of 75%

agreement eliminated one item on the upper secondary education/high school Environmental Factors section and three of the four items suggested by participants from survey one (i.e., only Recreation and leisure for lower secondary education/middle school Activities and Participation section remained).

Distribution of ICF-CY Codes by Education Code Sets

A total of 77 items were retained from the Activities and Participation, Body Functions, and Environmental Factors domains across the three education level code sets. An examination was made of final items in the code set for each education level. There was variability in the distribution of items by domain across the three code sets. Relative domain representation varied from 19% to 47%. Proportional item distribution by ICF-CY domain for each education code set is presented in Table 9. A full review of code sets by education level can be found in Appendix C.

Table 9

Number and Percentage of Items Rated as Essential in Round Two by Educational Level

	Activities and Participation (39 items)	Environmental Factors (18 items)	Body Functions (20 items)	Total Items (77 items)
Primary education/elementary school	27 (47%)	15 (26%)	15 (26%)	57
Lower secondary education/middle school	31 (47%)	16 (24%)	19 (29%)	66
Upper secondary education/high school	25 (38%)	10 (19%)	17 (33%)	52

Activity and participation domain. There were 14 Activity and Participation codes that were shared across all three educational levels and 16 codes that were shared between two of the education code sets (i.e., either between primary education/elementary school and lower

secondary education/middle school or between lower secondary education/middle school and upper secondary education/high school) (Table 10). The codes that were shared across all three levels could be grouped in terms of activities of learning (Listening, Acquiring information, Directing attention, Thinking), skill acquisition (Reading, Writing, Calculating), self-management (Making decisions, Carrying out daily routine, Managing one’s own behaviour), communication (Communication with – receiving – spoken messages, Communicating with – receiving – nonverbal messages, Speaking), and relationships (Informal social relationships). No codes were shared just between the primary education/elementary school and upper secondary education/high school levels.

Table 10

Activity and Participation Items Shared Across Code Sets

ICF-CY Code Number	ACTIVITY AND PARTICIPATION	Elementary School	Middle School	High School
d110	Watching (i.e., using the sense of seeing intentionally to experience visual stimuli)	X	X	
d115	Listening (i.e., using the sense of hearing intentionally to experience auditory stimuli)	X	X	X
d132	Acquiring information (i.e., obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names)	X	X	X
d1332	Acquiring syntax (i.e., learning to produce appropriately constructed sentences or set of sentences)	X		
d135	Rehearsing (i.e., repeating a sequence of events or symbols as a basic component of learning)	X		
d137	Acquiring concepts (i.e., developing competence to understand and use basic and complex related to the characteristics of things, persons or events)	X	X	
d140	Learning to read (i.e., developing the competence to read written material with fluency and accuracy, such as recognizing characters and alphabets, sounding out written words with correct pronunciation, and understanding words and phrases)	X		

d145	Learning to write (i.e., developing the competence to produce symbols that represent sounds, words or phrases in order to convey meaning)	X		
d150	Learning to calculate (i.e., developing the competence to manipulate numbers and perform simple and complex mathematical operations)	X		
d1551	Acquiring complex skills (i.e., learning integrated sets of actions so as to follow rules and to sequence and coordinate one's movements, such as learning to play games and to use a building tool)	X	X	
d160	Focusing attention (i.e., intentionally focusing on specific stimuli, such as by filtering out distracting noises)	X	X	
d161	Directing attention (i.e., intentionally maintaining attention to specific actions or tasks for an appropriate length of time)	X	X	X
d163	Thinking (i.e., formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting)	X	X	X
d166	Reading (i.e., performing activities involved in the comprehension and interpretation of written language, for the purpose of obtaining general knowledge or specific information)	X	X	X
d170	Writing (i.e., using or producing symbols to language to convey information)	X	X	X
d172	Calculating (i.e., performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results)	X	X	X
d175	Solving problems (i.e., finding solutions to questions or situations by identifying and analyzing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution)		X	X
d177	Making decisions (i.e., making a choice among options, implementing the choice, and evaluating the effects of the choice)	X	X	X
d210	Undertaking a single task (i.e., carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task, organizing time, space and	X		

	materials for a task, pacing task performance, and carrying out, completing and sustaining a task)			
d220	Undertaking multiple tasks (i.e., carrying out simple or complex and coordinated actions as components of multiple, integrated and complex tasks in sequence or simultaneously)		X	X
d230	Carrying out daily routine (i.e., carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties)	X	X	X
d240	Handling stress and other psychological demands (i.e., carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises)		X	X
d250	Managing one's own behaviour (i.e., carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences)	X	X	X
d310	Communicating with – receiving – spoken messages (i.e., comprehending literal and implied meanings of messages in spoken language)	X	X	X
d315	Communicating with – receiving – nonverbal messages (i.e., comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings)	X	X	X
d325	Communicating with – receiving – written messages (i.e., comprehending the literal and implied meanings of messages that are conveyed through written language)		X	X
d330	Speaking (i.e., producing words, phrases and longer passages in spoken messages with literal and implied meaning)	X	X	X
d335	Producing nonverbal messages (i.e., using gestures, symbols and drawings to convey messages)	X	X	
d345	Writing messages (i.e., producing the literal and implied meanings of messages that are conveyed through written language)		X	X
d350	Conversation (i.e., starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with one or more persons one knows or who are strangers, in formal or casual settings)		X	X
d355	Discussion (i.e., starting, sustaining and ending an examination of a matter, with arguments for or		X	X

	against, or debate carried out by means of spoken, written, sign or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings)			
d3601	Using writing machines (e.g., using computers as means of communication)		X	X
d440	Fine hand use (i.e., performing coordinated actions of handling objects, picking up, manipulating and releasing them using one's hand, fingers and thumb)	X		
d710	Basic interpersonal interactions (i.e., interacting with people in a contextually and socially appropriate manner)	X	X	
d720	Complex interpersonal interactions (i.e., maintaining and managing interactions with other people, in a contextually and socially appropriate manner, such as by regulating emotions and impulses, controlling verbal and physical aggression, acting independently in social interactions, and acting in accordance with social rules and conventions)		X	X
d740	Formal relationships (i.e., creating and maintaining specific relationships in formal settings)			X
d750	Informal social relationships (i.e., entering into relationships with others, such as playmates)	X	X	X
d820	School education (i.e., gaining admission to school, education; engaging in all school-related responsibilities and privileges; learning the course material, subject and other curriculum requirements in a primary or secondary education programme, including attending school regularly; working cooperatively with other students, taking direction from teachers, organizing, studying and completing assigned tasks and projects, and advancing to other stages of education)		X	X
d920	Recreation and leisure (i.e., engaging in any form of play, recreational or leisure activity, such as informal or organized play and sports, programmes of physical fitness, relaxation, amusement or diversion, going to art galleries, museums, cinemas or theatres; engaging in crafts or hobbies, reading for enjoyment, playing musical instruments; sightseeing, tourism and travelling for pleasure)		X	

Environmental factors domain. An analysis of Environmental Factors codes revealed eight items that were rated as essential across all three education code sets and seven items that were shared between two of the education code sets (i.e., either between primary education/elementary school and lower secondary education/middle school or between lower secondary education/middle school and upper secondary education/high school) (Table 11). Specifically, the codes that were shared across all three levels could be grouped in terms of products and technology (Products of technology for personal use in daily living, Products and technology for personal indoor and outdoor mobility and transportation, Products and technology for communication, Products and technology for education), family and friends (Immediate family, Friends), and services, systems, and policies (Health services, systems and policies, Education and training services, systems and policies). There was no overlap between just the primary education/elementary school and upper secondary education/high school levels.

Table 11

Environmental Factors Items Shared Across Code Sets

ICF-CY Code Number	ENVIRONMENTAL FACTORS	Elementary School	Middle School	High School
e1100	Food (e.g., nutrition)	X	X	
e1101	Drugs (e.g., for medicinal purposes)		X	X
e115	Products and technology for personal use in daily living (e.g., furniture, chairs, personal care equipment, adapted or specially designed devices and orthopedic devices)	X	X	X
e1152	Products and technology used for play (e.g., adapted materials for play indoors and playground/outside)	X		
e120	Products and technology for personal indoor and outdoor mobility and transportation (e.g., adapted chairs, walking devices, wheelchair)	X	X	X
e125	Products and technology for communication (e.g., telephone, TV and video, computers, aids for sight and hearing, aids for writing)	X	X	X

e130	Products and technology for education (e.g., books, computers, educational toys, adapted material for learning such as computer software)	X	X	X
e240	Light (e.g., intensity and quality of sunlight or artificial lighting, which may provide useful or distracting information about the world)	X	X	
e250	Sound (e.g., intensity and quality of sound, which may provide useful or distracting information about the world)	X	X	
e260	Air quality [i.e., characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world]	X	X	
e310	Immediate family	X	X	X
e320	Friends	X	X	X
e330	People in positions of authority		X	
e340	Personal care providers and personal assistance (e.g., nannies)	X		
e410	Individual attitudes of immediate family members	X	X	
e420	Individual attitudes of friends		X	X
e580	Health services, systems and policies (i.e., services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle)	X	X	X
e585	Education and training services, systems and policies (i.e., services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills)	X	X	X

Body functions domain. A comparison of Body Functions codes revealed 12 items that were shared across all three educational levels and seven items shared between two of the educational levels (i.e., either between primary education/elementary school and lower secondary education/middle school or between lower secondary education/middle school and upper secondary education/high school) (Table 12). Similarly to the Activities and Participation and Environmental Factors domains, no codes were shared just between the primary education/elementary school and upper secondary education/high school levels. The codes that were shared across all three levels could be grouped in terms of functions of the mind

(Consciousness functions, Intellectual functions, Global psychosocial functions, Memory functions), self-regulation (Adaptability, Activity level, Motivation, Impulse control, Attention functions, Emotional functions), and language (Reception of Language, Expression of Language).

Table 12

Body Functions Items Shared Across Code Sets

ICF-CY Code Number	BODY FUNCTIONS	Elementary School	Middle School	High School
b110	Consciousness functions (e.g., state of awareness and alertness)	X	X	X
b117	Intellectual functions (e.g., all cognitive functions and their development over the life span)	X	X	X
b122	Global psychosocial functions (e.g., lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions)	X	X	X
b1250	Adaptability (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner)	X	X	X
b1251	Responsivity (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner)	X	X	
b1252	Activity level (i.e., disposition to act or react with energy and action rather lethargy and inaction)	X	X	X
b1253	Predictability (i.e., disposition to act or react in a predictable and stable manner rather than an erratic or unpredictable manner)		X	X
b1254	Persistence (i.e., disposition to act with an appropriately sustained rather than limited effort)		X	X
b1300	Energy level (i.e., mental functions that produce vigour and stamina)		X	X
b1301	Motivation (i.e., mental functions that produce the incentive to act)	X	X	X
b1304	Impulse control (i.e., mental functions that regulate and resist sudden intense urges to do something)	X	X	X

b140	Attention functions (i.e., functions of sustaining attention, shifting attention, dividing attention, sharing attention; concentration; distractibility)	X	X	X
b144	Memory functions (e.g., short-term memory, long-term memory, retrieval and processing of memory)	X	X	X
b152	Emotional functions (i.e., functions of appropriateness of emotion, regulation of emotion, and range of emotion)	X	X	X
b163	Basic cognitive functions (i.e., mental functions involved in acquisition of knowledge about objects, events and experiences; and the organization and application of that knowledge in tasks requiring mental activity)	X	X	
b164	Higher-level cognitive functions (i.e., abstraction, organization and planning, time management, cognitive flexibility, insight, judgement, problem-solving)		X	X
b1670	Reception of language (i.e., specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning)	X	X	X
b1671	Expression of language (i.e., specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language)	X	X	X
b172	Calculation functions (i.e., specific mental functions of determination, approximation and manipulation of mathematical symbols and processes)		X	X
b320	Articulation functions (i.e., functions of the production of speech sounds)	X		

Shared ICF-CY Codes Across Education Code Sets

Table 13 provides important information about the shared items across the code sets. Elementary and middle school levels shared 20 out of 39 Activity and Participation codes; however, elementary and high school levels only shared 14 out of 39. The sharing of codes between elementary and middle schools in this domain were related to activities of learning

(Watching, Listening, Acquiring information, Acquiring concepts, Acquiring complex skills, Focusing attention, Directing attention, Thinking), skill acquisition (Reading, Writing, Calculating), self-management (Making decisions, Carrying out daily routine, Managing one’s own behaviour), communication (Communication with – receiving – spoken messages, Communicating with – receiving – nonverbal messages, Speaking, Producing nonverbal messages), and relationships (Basic interpersonal interactions, Informal social relationships). The sharing of codes between elementary and high schools in this domain were also related to activities of learning (Listening, Acquiring information, Directing attention, Thinking), skill acquisition (Reading, Writing, Calculating), self-management (Making decisions, Carrying out daily routine, Managing one’s own behaviour), communication (Communication with – receiving – spoken messages, Communicating with – receiving – nonverbal messages, Speaking, Producing nonverbal messages), and relationships (Basic interpersonal interactions, Informal social relationships).

Table 13

ICF-CY Codes Shared Across Educational Levels

	MS AP	MS EF	MS BF	HS AP	HS EF	HS BF
ES AP	20/39			14/39		
ES EF		16/18			8/18	
ES BF			14/20			12/20
MS AP				24/39		
MS EF					10/18	
MS BF						17/20

ES = Elementary School; MS = Middle School; HS = High School

AP = Activity and Participation; EF = Environmental Factors; BF = Body Functions

Elementary and middle school levels shared 16 out of 18 Environmental Factors codes; however, elementary and high school levels only shared 8 out of 18. The sharing of codes between elementary and middle schools in this domain were related to basic needs (Food),

products and technology (Products of technology for personal use in daily living, Products and technology for personal indoor and outdoor mobility and transportation, Products and technology for communication, Products and technology for education), learning environment (Light, Sound, Air quality), family and friends (Immediate family, Friends, Individual attitudes of immediate family members), and services, systems, and policies (Health services, systems and policies, Education and training services, systems and policies). The sharing of codes between elementary and high schools in this domain were also related to products and technology (Products of technology for personal use in daily living, Products and technology for personal indoor and outdoor mobility and transportation, Products and technology for communication, Products and technology for education), family and friends (Immediate family, Friends), and services, systems, and policies (Health services, systems and policies, Education and training services, systems and policies).

The overlap of shared codes between elementary and middle school levels and elementary and high school levels were more closely related in the Body Functions domain. Elementary and middle school levels shared 14 out of 20 Body Functions codes and elementary and high school levels shared 12 out of 20. The sharing of codes between elementary and middle schools in this domain were related to functions of the mind (Consciousness functions, Intellectual functions, Global psychosocial functions, Memory functions, Basic cognitive functions), self-regulation (Adaptability, Responsivity, Activity level, Motivation, Impulse control, Attention functions, Emotional functions), and language (Reception of Language, Expression of Language). The sharing of codes between elementary and high schools in this domain were also related to functions of the mind (Consciousness functions, Intellectual functions, Global psychosocial functions, Memory functions), self-regulation (Adaptability,

Activity level, Motivation, Impulse control, Attention functions, Emotional functions), and language (Reception of Language, Expression of Language).

Middle and high school levels shared 24 out of 39 Activity and Participation codes related to activities of learning (Listening, Acquiring information, Directing attention, Thinking), skill acquisition (Reading, Writing, Calculating), self-management (Solving Problems, Making decisions, Undertaking multiple tasks, Carrying out daily routine, Handling stress and other psychological demands, Managing one's own behaviour, School education), communication (Communication with – receiving – spoken messages, Communicating with – receiving – nonverbal messages, Communicating with – receiving – written messages, Speaking, Writing messages, Conversation, Discussion, Using writing machines) and relationships (Complex interpersonal interactions, Informal social relationships). These two levels shared 10 out of 18 Environmental Factors codes related to medication (Drugs), products and technology (Products of technology for personal use in daily living, Products and technology for personal indoor and outdoor mobility and transportation, Products and technology for communication, Products and technology for education), family and friends (Immediate family, Friends, Individual attitudes of friends), and services, systems, and policies (Health services, systems and policies, Education and training services, systems and policies). Additionally, these two levels shared 17 out of 20 Body Functions codes related to functions of the mind (Consciousness functions, Intellectual functions, Global psychosocial functions, Memory functions, Higher-level cognitive functions, Calculation functions), self-regulation (Adaptability, Activity level, Predictability, Persistence, Energy level, Motivation, Impulse control, Attention functions, Emotional functions), and language (Reception of Language, Expression of Language).

Elementary and high school educational levels are on opposite ends of the learning continuum; therefore, it is not surprising that these two levels have fewer codes in common than elementary school and middle school or middle school and high school. The codes that were shared between two levels (i.e., elementary and middle, middle and high, and elementary and high) did have commonality with regard to the types of overarching activities defined by the codes (i.e., learning, skill acquisition, self-management, communication, relationships, products and technology, family and friends, services, systems, and policies, functions of the mind, self-regulation, and language). This indicates that many characteristics of learning happen along the learning continuum, but the level of complexity increases in the move from elementary to high school.

CHAPTER 4: DISCUSSION AND IMPLICATIONS

The primary aim of this study was to enhance utility of the ICF-CY for research, policy, and practice in education application by deriving three ICF-CY education code sets representing essential dimensions of child functioning based on consensus from an international panel of multidisciplinary experts. The Delphi technique was used to obtain consensus through two rounds of online surveys. The results of this study produced three unique code sets that correspond to commonly recognized educational levels (i.e., primary education/elementary school, lower secondary education/middle school, upper secondary education/high school). These code sets were endorsed by experts representing 44 different countries and at least 15 different disciplines who work in a variety of settings and capacities.

Overall, a total of 73 individuals participated in the study. A high level of agreement among study participants was reached regarding items essential to include in the education code sets (72% to 100%) during Delphi round two. Participant responses yielded three education level based item sets that were approximately two-thirds of the initial 82 items presented.

This chapter will begin by highlighting the constructs represented in the final Education Code Sets and discussing the reliability and validity of the results. Next, study limitations and contributions to the field will be presented. Finally, the chapter concludes with suggestions for application and future research of the ICF-CY Education Code Sets.

Use of “Code Sets” Terminology

The clinical use of ICF “core sets,” reduced sets of items specific to a single health condition or disease, is to confirm medical diagnoses in adults. The ICF-CY was created to

address the dynamic nature of development and varying manifestations of disease or disability in children. The ICF-CY provides a standard for classifying dimensions of functioning and disability regardless of the underlying cause. To that end, using a diagnosis-based reduced item classification set for children would be problematic as it would be limited in use for comparative documentation of functioning (Simeonsson, 2009). The difficulty with defining disability in younger, less mature children (Simeonsson, 2006, p. 67), the variability that exists in child functioning within a given diagnosis, and the fact that childhood diagnoses are less stable than adult diagnoses are all reasons why there is more interest in the broader focus of describing childhood functioning beyond simply confirming a diagnosis. Thus, there was a need to create reduced item sets with that broader focus in mind. The derived code sets are intended to reflect characteristics of functioning of children at different educational levels regardless of health condition or disability. The term “code” was substituted for “core” to reflect intended difference in application between the two types of reduced item sets.

The three Education Code Sets were created to identify codes applicable to commonly recognized educational levels (i.e., primary education/elementary school, lower secondary education/middle school, and upper secondary education/high school). Potential indicators of functioning for the Delphi study were selected from the ICF-CY for the domains Activity and Participation, Environmental Factors, and Body Functions after a review of research and findings from ICF-CY field trials. Codes from the domain of Body Structures were not included in that the domain is defined as “anatomical parts of the body such as organs, limbs and their components” (WHO, 2007, p. 11) and thus seen as less essential for defining child characteristics in educational settings.

Constructs Represented in the Education Code Sets

Currently, the United States does not have a national curriculum. It is required or recommended, however, by states, school districts, and national associations “that certain standards be used to guide school instruction. In addition, federal law mandates that state standards be developed and improved in order for states to receive federal assistance” (United States Department of Education, 2008, p. 1). In this study, participants rated early learning and communication items (e.g., Rehearsing, Learning to read, Learning to write, Learning to calculate, Acquiring syntax) as essential to include in the Primary Education/Elementary School Education Code Set. Additionally, the codes “Products and technology used for play,” “Personal care providers and personal assistance,” and “Articulation functions” were also rated as essential for this code set.

In contrast, the Lower Secondary Education/Middle School and Upper Secondary Education/High School Education Code Sets includes more complex learning and communication items (e.g., Acquiring concepts, Acquiring complex skills, Communicating with – receiving – written messages, Conversation, Discussion), as well as items related to more complex interpersonal interactions. In addition, the codes “Individual attitudes of friends,” “Predictability,” “Persistence,” “Energy level,” and “Higher-level cognitive functions” items were rated as essential for these two code sets.

Reliability and Validity of Results

Study Design

The goal of this study was to derive ICF-CY education code sets that could be utilized by international professionals who work with/for children in a variety of disciplines. In order to achieve this goal, an appropriate research method that could elicit expert opinion from intended

users of the ICF-CY who are culturally and professionally diverse was required. As such, experts were invited to participate in a Delphi study to come to a consensus about which ICF-CY items in the Activity and Participation, Environmental Factors, and Body Functions domains were essential to include in reduced item education level-based code sets.

Appropriateness of the Delphi technique. The Delphi technique was selected as an appropriate research method for this study for several reasons. First, the design of this study followed a process similar to that used to develop ICF Core Sets in earlier studies for adult medical conditions and diseases. That process involves a literature review, identification of an initial set of ICF-CY codes for the survey, and multiple round expert responses using the Delphi technique. Thus, a thorough review of the ICF Core Set research was conducted to guide the design and implementation procedures that were used.

Second, this research method enabled participation of a large number of geographically dispersed individuals at a time convenient to each participant. Third, this technique is an inexpensive method that allowed efficient recruitment of experts located in various countries. Finally, an online format was used to collect the data allowing the immediate analysis of data required. The use of a flexible, affordable, technology forward approach aided in the achievement of the goal of obtaining expert consensus of education code sets from national and international stakeholders who are the intended consumers of the WHO ICF-CY.

For the current study, the Delphi technique was used to obtain consensus from a diverse, international panel of 73 professionals about essential ICF-CY items to include in education code sets. An initial list of 82 ICF-CY codes was presented to participants in the first online survey, with the modified list from the first survey presented in a second survey. A high level of consensus was reached about the most important items to include for different educational levels.

The codes on which consensus was obtained were the basis for the three brief code sets of key indicators of child health, functioning, and development derived from the ICF-CY. Overall, consensus on items in the final survey indicated strong support for the three derived education code sets. The education code sets were endorsed by almost all of the participants.

Reliability of findings. The generalizability and credibility of Delphi technique results are defined by the study participants. “The number and representativeness of participants will affect the potential for ideas as well as the amount of data to be analyzed” (Hasson, Keeney, & McKenna, 2000, p. 1010). One strong aspect of this study is the culturally and professionally diverse international panel of experts. Considerable effort went into participant recruitment and selection in order to achieve representation from different cultures, disciplines, and professional settings. In addition, the overall retention rate of the panel of experts was quite high (79%). A number of group and individual emails were sent to invite participants to take part in the study, to remind participants to complete surveys, and to thank them for their time and contribution to the study. The high response and retention rates achieved without the provision of compensation apart from a copy of the final code sets, provide further credibility of the results.

Furthermore, the majority of the participants were experienced experts with the highest level of education in their fields. These professionals (e.g., professors, researchers, and clinicians) had extensive knowledge regarding research and practice in their respective fields. Additionally, since the participants had varying levels of familiarity with the ICF-CY, ranging from “not at all familiar (e.g., have not seen content/do not know purpose)” to “extremely familiar (e.g., have applied in research, used in practice, taught, and/or participated in development and construction of the ICF-CY),” utilizing an online format strengthened the credibility of the study findings. Anonymity provided by an online format ensured that no single

person could influence individual ratings, as some participants in an in-person focus group, for example, may defer to the group if opinions differ. A final factor supporting credibility of the findings is that endorsement of consensus codes was provided by almost all of the participants in the second survey.

Cultural bias in a global taxonomy. The ICF-CY was designed to be used globally. In order to evaluate application and reduce cultural bias, the ICF-CY workgroup piloted items in a number of countries. The ICF-CY endured extensive field testing in the United States, Italy, Japan, Sweden, and Sudan. In addition, experts from 23 countries participated in the design activities including examining terminology, conceptual sources, and classification approaches prior to the WHO's endorsement of the ICF-CY (McLeod & Threats, 2008).

Content validity. A review of specific items for each code set is broadly consistent with curricular expectations. Final code set items appropriately reflect increasingly complex and advanced functions as educational levels increase. The items retained at different educational levels align with general expectations; no major deviations were found regarding items representing behaviors, skills, or functional characteristics too advanced or inappropriate for a child within a specific educational level. At the same time, there appeared to be appropriate overlap with some functional items crossing educational levels. More Activity and Participation domain codes were endorsed than codes in other domains across all three educational levels.

Cross-cultural comparability of content of Brazilian core set. The current study was designed to have an international panel in order to produce a product that would be useful across cultures. The availability of a recent study in Brasil provided the author the opportunity to do a comparison of shared content which in turn strengthened the validity of the current study. A study group was conducted in Brasil from August 2016 to July 2017 to create a core set for

special education (de Souza Rocha, Schmidt, Miguel, 2020). The resulting Biopsychosocial Functioning Form (FBF) included 25 Activities and Participation codes, 54 Environmental Factors codes, and 6 Body Functions codes. There were codes shared between the current Education Code Sets and the Brazilian Biopsychosocial Functioning Form. The commonalities between the two provide some support for the cross-cultural validity of the content of the Education Code Sets. Tables 14 and 15 provide details regarding codes shared by the FBF and the Education Code Sets. There was no overlap with the Body Functions codes (Table 16) which may be explained by the fact that the FBF was focused on special education whereas the Education Codes Sets are for use in education in general. Although there were more Body Functions codes in the Education Code Sets, the items included related to learning, whereas in the FBF the Body Functions codes were items describing characteristics of disability.

Table 14

ICF-CY Activities and Participation Codes Shared Between Education Code Sets and Brazilian Biopsychosocial Functioning Form

Chapter	Education Code Sets	Code Overlap	FBF Core Set
1. Learning and applying knowledge	18	3	3
2. Task demands	5	0	0
3. Communication	9	4	4
4. Mobility	1	0	4
5. Self-care	0	0	6
6. Domestic life	0	0	2
7. Interpersonal interactions	4	1	3
8. Major life areas	1	1	2
9. Community, social and civic life	1	0	1
Total	39	9	25

Table 15

ICF-CY Environmental Factors Codes Shared Between Education Code Sets and Brazilian Biopsychosocial Functioning Form

Chapter	Education Code Sets	Code Overlap	FBF Core Set
1. Products and technologies	7	7	8
2. Natural and human made environments	3	2	3
3. Support and relationships	4	0	0
4. Attitudes	2	1	6
5. Services, systems and policies	2	2	6
Total	18	16	23

Table 16

ICF-CY Body Functions Codes Shared Between Education Code Sets and Brazilian Biopsychosocial Functioning Form

Chapter	Education Code Sets	Code Overlap	FBF Core Set
1. Mental functions	19	0	1
2. Sensory functions	0	0	3
3. Voice and speech	1	0	0
4. Cardiovascular	0	0	0
5. Digestive/metabolic	0	0	1
6. Genitourinary functions	0	0	1
7. Neuromuscular	0	0	0
8. Skin	0	0	0
Total	20	0	6

Limitations and Future Direction

Study Limitations

This study has many potential applications of the ICF-CY to education and creation of new information, but several limitations of the study need to be considered. While the participants represented several countries and disciplines, more than half of the respondents were

from the United States. The study results would have been greatly enhanced with more participation from professionals working in other countries. “The results of any consensus process may differ with different groups of experts” (Stucki et al., 2004, p.112). Therefore, validation studies are required for these code sets. In particular, better representation from professionals in Africa, the Caribbean, Central America, Oceania, and South America would provide additional confirmation that the education code sets are appropriate and adequate for worldwide use. In the same way, increased participation from clinicians, policy makers, and administrators would provide increased likelihood of reliable and adequate content coverage. Future efforts may include validation studies of each education code set by experts who primarily work with children within a given educational level. Validation studies (e.g., focus groups, comparison with existing measures and standards of education) are needed in order to evaluate the application of the education code sets in practice in a variety of professional settings. In addition, feedback from families would be an important follow-up study.

Study Contributions

The ICF-CY contains more than 1,600 codes. While the comprehensiveness of the system is noted as a strength, it is also a major challenge to its practical usage (Stier-Jarmer, Cieza, Borchers, & Stucki, 2009). In daily practice, professionals only need a fraction of the categories found in the ICF-CY. To aid in the practical application of the ICF-CY, a smaller set of selected codes, such as the resulting education code sets from the current study, could serve as a minimal set for reference in research and practice with children. With fewer codes to reference, a researcher or a clinician may be more motivated to incorporate the ICF-CY items into practice.

With the multidimensional scope of the ICF-CY, the application of its framework and codes can be useful for education. Most applications of the ICF-CY up to this point have been

focused on diagnostic issues. Specifically, use of the ICF-CY in education has been largely oriented to special education disability [e.g., ADHD (de Schipper, et al., 2015)]. This study examined the potential utility of the ICF-CY within the field of education that is not focused on diagnostic issues (e.g., applications related to special education), but is geared toward broader applications of how children and youth function within school settings. The Education Code Sets promote the ICF-CY as a shared language of functional codes to help researchers, practitioners, and policy makers effectively communicate regarding how to characterize children's functioning, monitor change, identify environmental barriers, and determine functional priorities for children and families across educational levels regardless of their nationality or professional discipline.

This study also introduced a practical application of the universal language of the ICF-CY to influential researchers, practitioners, and policy makers in several different countries. Although a substantial number of participants had experience with the ICF-CY, a third of the participants indicated that they were not familiar with the ICF-CY and more than half of the participants had not applied the ICF-CY prior to the study. In that the ICF-CY is a new classification system, awareness about its purpose and potential uses is limited, this study helped to promote knowledge about its application to professionals.

ICF-CY Education Code Set Applications

The ICF-CY Education Code Sets offer a range of potential applications to the field of education. Broadly, these include promoting a holistic view of all children (with and without disabilities) among educators and other school professionals, advancing evidence-based practice, and encouraging assessment and intervention practices that identify environmental factors as treatment targets. The following sections describe how these Education Code Sets are applicable.

Promote holistic view of children. Children attend school to learn; however, they are not just empty vessels waiting to be filled. They have knowledge and life experiences that shape their minds, bodies, and spirits. Many schools and classrooms are set up to focus primarily on the cognitive aspects of learning. The ICF-CY Education Code Sets can provide schools with information to consider other characteristics of the children (e.g., physical ability, social and emotional wellbeing) that contribute to their overall experience at school. A holistic approach to the child encourages assessment of each child's developmental and learning characteristics and considers her or his ability level across domains of functioning, activities and participation.

Advance evidence-based practice. An important potential application of the Education Code Sets is their use in evidence-based practice. Specifically, they could serve as documentation in the eight ways that the ICF-CY has been proposed to advance evidence-based practice (Simeonsson, 2009): (1) as a basis for differentiated assessment; (2) emphasize collecting profiles of individual child functioning; (3) clarify clinical diagnoses, dual diagnosis/co-morbidity; (4) support service delivery that is provided on the basis of functional profiles rather than administrative categories or medical diagnoses; (5) enhance the correspondence between assessment and intervention planning for an individual child; (6) offer codes to identify intervention outcomes; (7) document the gradient and hierarchy of change in functioning as evidence for progress; and (8) generate summary statistics of children or populations defined by functional characteristics (Simeonsson, 2009, p. 72). The three ICF-CY Education Code Sets derived in this study could be used to approach any of the eight identified goals to advance evidence-based practice and to promote a bio-ecological model of disability to describe children's functioning in everyday life.

Advance assessment and intervention practices. The ICF-CY Education Code Sets supports the ICF conceptual framework that describes dimensions of child functioning over the medical model of impairment where differences are conceptualized in terms of disease or deficit (Florian, et al., 2006). Childhood disability has been viewed as a static problem defined by the manifestation of a health condition that resulted in a physical or mental impairment. Including classification of functioning within activities and participation, environmental factors, and body functions in assessments encourages the consideration of identifying environmental targets for intervention. In addition, it aids in the selection of appropriate goals that support children's successful participation in all aspects of school and learning.

Future Directions

The results from this study have reduced the time necessary to evaluate and determine the most crucial dimensions that need to be considered for educational uses of the ICF-CY, thus facilitating the translation of this tool into practice. The distribution of these internationally agreed upon code sets could help to further promote the ICF-CY shared conceptual model of child health and functioning in the context of schools by advocating for and guiding the development of new instruments that align with the ICF-CY. Future efforts could involve targeted validation studies for the consensus of these items and translation of the items into an accessible multidisciplinary screener or functional outcomes checklist. Providing participants with a PDF copy of the final Education Code Sets via email was the first step toward initiating follow-up validation studies.

Contribute to research on the development of intervention programs and outcome measures. More research could be conducted to examine the potential usage of the ICF-CY as a common reference framework to aid in the development of intervention programs and outcome

measures. Outcome measures are expected to address the specific goals targeted by interventions. Without a universally agreed upon conceptual model of functioning and disability, there may be a large number of outcome measures which differ in the areas of functioning they are intended to address. The ICF's integration of the biomedical and societal models provides an extensive classification system that addresses the impact of a health condition or disability on functioning (Stier-Jarmer et al., 2009).

An important future application of the ICF-CY Education Code Sets is to develop instruments or identify measures utilizing the standard qualifiers levels of severity in the ICF-CY (Simeonsson, 2009). Upon validation, the Education Code Sets could contribute to this endeavor by being used to design measures (e.g., educational screener) that could document the severity of a child's ability and functioning in the areas of Activities and Participation, Environmental Factors, and Body Functions could inform the intensity of intervention services required for that child to experience an equitable education. In addition, a similar measure could be used at the end of the implementation of an intervention to evaluate outcomes based on the intensity of intervention services the child received.

Develop comprehensive education code sets. The development of ICF Core Sets in number of other fields such as rehabilitation include both brief (as few as nine codes in core sets for obesity) and comprehensive (as many as 219 codes in core sets for obesity) versions (Stucki et al., 2004). Additional studies with experts who work with children in specific educational levels (i.e., primary education/elementary school, lower secondary education/middle school, upper secondary education/high school) would validate each individual education code set. Furthermore, the process of conducting a Delphi study with specific groups of experts based on the educational level they work with could lead to more codes being highlighted as essential to

include in each educational code set, thus creating comprehensive versions of the education code sets.

In addition, Delphi studies with groups of professionals by discipline could produce code sets with items prioritized differently. Although the current education code sets align with research on important education level expectations, professional background and service setting of the participants are two factors that could influence item representation of the final code sets if further examination was conducted. Finally, feedback from parents and children could provide an important perspective regarding the items included in each of the education code sets derived in the current study.

Examine utility for collaboration in service delivery. "The ICF-CY gives medical, educational, child care, and other relevant clinicians and researchers a systematic approach for understanding and communicating about functioning in children and youth" (Lollar, 2008, p. 21). Research could be conducted to examine service provider attitudes about the usefulness of the education code sets. More specifically, service providers could provide information regarding effects using the education code sets have on communication between team members, understanding about child functioning, and the quality of intervention service delivery. Caregiver questionnaires that asked parents to provide information regarding their child's functioning before, during, and after an intervention could provide additional assessment of the usefulness of the education code sets.

Conclusion

Classifying childhood disability is a challenge in health and education settings due to the differences that exist in the instruments used to document childhood disability across countries, professional disciplines, and settings. This variability compromises reliable prevalence rates,

limits valid comparisons of consequences of diagnosed conditions, and reduces knowledge about functional outcomes. The lack of a universal definition of childhood disability has made it especially challenging to establish a standard classification system. These issues were addressed when the ICF-CY was endorsed by the World Health Organization in 2007 as the first universal classification system available to document health, functioning, and disability in children. The ICF-CY provides a common language and shared conceptualization of childhood disability for children birth through seventeen years of age. The ICF-CY was designed to document the characteristics of developing children for a variety of purposes including program planning, research, and documentation of intervention outcomes (WHO, 2007). Application of the ICF-CY is important to unify data on child health status and functional characteristics; however, it is limited by the comprehensiveness of the inclusion of more than 1,600 codes.

The ICF-CY domains include qualifiers ranging from 0 to 4 that can be applied to the categories to denote severity of a problem, limitation, or restriction for functioning (i.e., 0=no problem, 1=mild, 2=moderate, 3=severe, 4=complete). An important future application of the ICF-CY Education Code Sets is to develop instruments or identify measures utilizing the standard qualifiers levels of severity in the ICF-CY (Simeonsson, 2009). Upon validation, the Education Code Sets could contribute to this endeavor by being used to design measures (e.g., educational screener) that could document the severity of a child's ability and functioning in the areas of Activities and Participation, Environmental Factors, and Body Functions could inform the intensity of intervention services required for that child to experience an equitable education. In addition, a similar measure could be used at the end of the implementation of an intervention to evaluate outcomes based on the intensity of intervention services the child received.

Children have the universal rights to health and education (UNICEF, n.d.). Florian, et al. (2006) stated that “classifying, categorizing, and labeling children” (p. 36) are considered essential when attempting to fairly distribute education and social services for students with disabilities; however, a standard comprehensive classification of education of all students does not currently exist. This study was conducted to enhance the utility and accessibility of the ICF-CY by asking international experts to identify essential characteristics of children and youth’s functioning during different educational levels. The Delphi technique was used to obtain expert consensus to derive three education code sets for children and youth in primary education/elementary school, lower secondary education/middle school, and upper secondary education/high school. A professionally diverse panel of 73 international experts completed two Delphi rounds of online surveys to rate the most important characteristics of child functioning to include in abbreviated educational level based ICF-CY Education Code Sets. The final code sets are intended to serve as a universal reference for minimal information to collect about child functioning in research, policy, and practice. This international classification system could provide opportunities for more effective communication across disciplines and countries; thereby increasing the reliability of data comparisons regarding child health and providing more consistent measurement of functioning. Such applications could inform system level decisions for prevention of learning, social, and academic problems of students, and thereby promote the health and wellness of all children.

APPENDIX A: QUALTRICS SURVEYS

A1 ICF-CY Education Code Sets Survey 1

ICF-CY Education Code Sets Survey 1

Start of Block: INTRODUCTION

Thank you for taking the time to participate in this study. A priority for the efficient use of the International Classification of Functioning, Disability and Health - Children & Youth (ICF-CY) is to identify a small number of codes that should be included in any approach to document child functioning. As there are more than 1,600 codes in the ICF-CY, it would be useful to identify a smaller number of codes that could serve as a minimal set for reference in research, policy, and application with children.

The purpose of this study is to identify a reduced set of items for three educational levels (primary education/elementary school, lower secondary education/middle school, upper secondary education/high school) drawing on the experience of persons knowledgeable about children. To that end, we would have appreciated your help in selecting codes you think are ESSENTIAL for each educational level.

End of Block: INTRODUCTION

Start of Block: 1. BACKGROUND

Q1 Which category best describes your professional field?

- Administrator (1)
- Audiologist (2)
- Child Development Specialist (3)
- Educator (special education) (4)
- Educator (early childhood) (5)
- Educator (primary education/elementary school) (6)
- Educator (lower secondary education/middle school) (7)
- Educator (upper secondary education/high school) (8)
- Medical Doctor/Physician (9)
- Nurse (10)
- Occupational Therapist (11)
- Physical Therapist (12)
- Psychologist (13)
- Social Worker (14)
- Other (15) _____

Q2 What is the nature of your work?

- administration (1)
 - advocacy (2)
 - clinical (3)
 - graduate student (4)
 - policy making (5)
 - research (6)
 - teaching (7)
 - other (8) _____
-

Q3 How long have you been involved in this work?

- less than 1 year (1)
 - 1-2 years (2)
 - 3-5 years (3)
 - 6-9 years (4)
 - 10-15 years (5)
 - 16-20 years (6)
 - 20+ years (7)
-

Q4 What is the highest level of education you have completed?

- Primary school (no high school degree) (1)
- Secondary education/high school (2)
- Some College/Associates Degree/2-Year degree (3)
- Vocational training after high school (4)
- College or university (4 years) (5)
- Graduate school (Masters degree or Specialist level) (6)
- Graduate school (Doctorate, PhD, MD, JD) (7)
- Other (8) _____

Page Break _____

Q5 Where is your primary national residency? (If you live or work in more than one country, please indicate the country where you have your primary employment or spend the majority of your time.)

Q6 Please indicate any other places in the world where you are involved or have been involved in work related to children and/or youth (e.g., collaborative research, program development, teaching, practice).

Africa (1)

Asia (2)

Caribbean (3)

Central America (4)

Europe (5)

North America (6)

Oceania (7)

South America (8)

Q7 If you selected a region above, please list the other country/countries where you have worked.

Page Break

Q8 Please rate your overall familiarity with the WHO ICF-CY.

- Not at all (e.g., have not seen content/do not know purpose) (1)
 - Somewhat (e.g., have some general knowledge about ICF-CY) (2)
 - Familiar (e.g., know content and understand purpose and use) (3)
 - Very familiar (e.g., have reviewed literature, explored application for use in practice or to include in research) (4)
 - Extremely familiar (e.g., have applied in research, used in practice, taught, and/or participated in development and construction of the ICF-CY) (5)
-

Q9 Have you ever used the ICF-CY in research, practice, or for program or policy development?

- Yes (1)
 - No (2)
 - Don't know (3)
-

Q10 Were you involved in the development or review of the ICF-CY?

- Yes (1)
 - No (2)
 - Don't know (3)
-

Page Break

End of Block: 1. BACKGROUND

Start of Block: 2. PRIORITIZING ICF-CY CODES

The next section provides a list of 82 items/codes from the ICF-CY. While some items/codes may be applicable to students in all educational levels, others may apply only to specific levels. Please review each item and place a check mark for the educational level(s) to which it applies. Only check items you think are ESSENTIAL to consider for the reduced item education code sets.

Below are the three educational levels:

Level 1: Primary Education/Elementary School

Level 2: Lower Secondary Education/Middle School

Level 3: Upper Secondary Education/High School

Q11 Please rate the following Activity and Participation items for each educational level. Remember to check the items that are ESSENTIAL to consider for inclusion in the reduced item education code set for each educational level.

	Level 1: Primary Education/Elementary School (1)	Level 2: Lower Secondary Education/Middle School (2)	Level 3: Upper Secondary Education/High School (3)
Watching (i.e., using the sense of seeing intentionally to experience visual stimuli) (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Listening (i.e., using the sense of hearing intentionally to experience auditory stimuli) (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquiring information (i.e., obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names) (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquiring syntax (i.e., learning to produce appropriately constructed sentences or set of sentences) (4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Rehearsing (i.e., repeating a sequence of events or symbols as a basic component of learning) (5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Acquiring concepts (i.e., developing competence to understand and use basic and complex related to the characteristics of things, persons or events) (6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Learning to read (i.e., developing the competence to read written material with fluency and accuracy, such as recognizing characters and alphabets, sounding out written words with correct pronunciation, and understanding words and phrases) (7)

Learning to write (i.e., developing the competence to produce symbols that represent sounds, words or phrases in order to convey meaning) (8)

Learning to calculate (i.e., developing the competence to manipulate numbers and perform simple and complex mathematical operations) (9)

Acquiring complex skills (i.e., learning integrated sets of actions so as to follow rules and to sequence and coordinate one's movements, such as learning to play games and to use a building tool) (10)

Focusing attention (i.e., intentionally focusing on specific stimuli, such as by filtering out distracting noises) (11)

Directing attention (i.e., intentionally maintaining attention to specific actions or tasks for an appropriate length of time) (12)

Thinking (i.e.,
formulating and
manipulating ideas,
concepts, and images,
whether goal-oriented
or not, either alone or
with others, with types
of thinking activities,
such as pretending,
playing with words,
creating fiction, proving
a theorem, playing with
ideas, brainstorming,
meditating, pondering,
speculating or
reflecting) (13)

Reading (i.e.,
performing activities
involved in the
comprehension and
interpretation of written
language, for the
purpose of obtaining
general knowledge or
specific information)
(14)

Writing (i.e., using or
producing symbols to
language to convey
information) (15)

Calculating (i.e.,
performing
computations by
applying mathematical
principles to solve
problems that are
described in words and
producing or displaying
the results) (16)

Solving problems (i.e.,
finding solutions to
questions or situations
by identifying and
analyzing issues,
developing options and
solutions, evaluating
potential effects of
solutions, and
executing a chosen
solution) (17)

Making decisions (i.e., making a choice among options, implementing the choice, and evaluating the effects of the choice) (18)

Undertaking a single task (i.e., carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task, organizing time, space and materials for a task, pacing task performance, and carrying out, completing and sustaining a task) (19)

Undertaking multiple tasks (i.e., carrying out simple or complex and coordinated actions as components of multiple, integrated and complex tasks in sequence or simultaneously) (20)

Carrying out daily routine (i.e., carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties) (21)

Handling stress and other psychological demands (i.e., carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises) (22)

Managing one's own behaviour (i.e., carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences) (23)

Communicating with – receiving – spoken messages (i.e., comprehending literal and implied meanings of messages in spoken language) (24)

Communicating with – receiving – nonverbal messages (i.e., comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings) (25)

Communicating with – receiving – written messages (i.e., comprehending the literal and implied meanings of messages that are conveyed through written language) (26)

Speaking (i.e., producing words, phrases and longer passages in spoken messages with literal and implied meaning) (27)

Producing nonverbal messages (i.e., using gestures, symbols and drawings to convey messages) (28)

Writing messages (i.e., producing the literal and implied meanings of messages that are conveyed through written language) (29)

Conversation (i.e., starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with one or more persons one knows or who are strangers, in formal or casual settings) (30)

Discussion (i.e., starting, sustaining and ending an examination of a matter, with arguments for or against, or debate carried out by means of spoken, written, sign or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings) (31)

Using writing machines (e.g., using computers as means of communication) (32)

Fine hand use (i.e., performing coordinated actions of handling objects, picking up, manipulating and releasing them using one's hand, fingers and thumb) (33)

Basic interpersonal interactions (i.e., interacting with people in a contextually and socially appropriate manner) (34)

Complex interpersonal interactions (i.e., maintaining and managing interactions with other people, in a contextually and socially appropriate manner, such as by regulating emotions and impulses, controlling verbal and physical aggression, acting independently in social interactions, and acting in accordance with social rules and conventions) (35)

Formal relationships (i.e., creating and maintaining specific relationships in formal settings) (36)

Informal social relationships (i.e., entering into relationships with others, such as playmates) (37)

School education (i.e., gaining admission to school, education; engaging in all school-related responsibilities and privileges; learning the course material, subject and other curriculum requirements in a primary or secondary education programme, including attending school regularly; working cooperatively with other students, taking direction from teachers, organizing, studying and completing assigned tasks and projects, and advancing to other stages of education)
(38)



Page Break

Q12 Please rate the following Environmental Factors items for each educational level.
Remember to check the items that are ESSENTIAL to consider for inclusion in the reduced item
education code set for each educational level.

	Level 1: Primary Education/Elementary School (1)	Level 2: Lower Secondary Education/Middle School (2)	Level 3: Upper Secondary Education/High School (3)
Food (e.g., nutrition) (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Drugs (e.g., for medicinal purposes) (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Products and technology for personal use in daily living (e.g., furniture, chairs, personal care equipment, adapted or specially designed devices and orthopedic devices) (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Products and technology used for play (e.g., adapted materials for play indoors and playground/outside) (4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Products and technology for personal indoor and outdoor mobility and transportation (e.g., adapted chairs, walking devices, wheelchair) (5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Products and technology for communication (e.g., telephone, TV and video, computers, aids for sight and hearing, aids for writing) (6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Products and technology for education (e.g., books, computers, educational toys, adapted material for learning such as computer software) (7)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Light (e.g., intensity and quality of sunlight or artificial lighting, which may provide useful or distracting information about the world) (8)

Sound (e.g., intensity and quality of sound, which may provide useful or distracting information about the world) (9)

Air quality [i.e., characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world] (10)

Immediate family (11)

Extended family (12)

Friends (13)

People in positions of authority (14)

Personal care providers and personal assistance (e.g., nannies) (15)

Individual attitudes of immediate family members (16)

Individual attitudes of extended family members (17)

Individual attitudes of friends (18)

Individual attitudes of people in positions of authority (19)

Individual attitudes of personal care providers and personal assistants (e.g., nannies) (20)

Health services, systems and policies (i.e., services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle) (21)

Education and training services, systems and policies (i.e., services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills) (22)

Page Break

Q13 Please rate the following Body Functions items for each educational level. Remember to check the items that are ESSENTIAL to consider for inclusion in the reduced item education code set for each educational level.

	Level 1: Primary Education/Elementary School (1)	Level 2: Lower Secondary Education/Middle School (2)	Level 3: Upper Secondary Education/High School (3)
Consciousness functions (e.g., state of awareness and alertness) (1)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Intellectual functions (e.g., all cognitive functions and their development over the life span) (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Global psychosocial functions (e.g., lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions) (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Adaptability (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner) (4)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Responsivity (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner) (5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Activity level (i.e., disposition to act or react with energy and action rather lethargy and inaction) (6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Predictability (i.e., disposition to act or react in a predictable and stable manner rather than an erratic or unpredictable manner) (7)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Persistence (i.e., disposition to act with an appropriately sustained rather than limited effort) (8)

Approachability (i.e., disposition to act in an initiating manner, moving towards persons or things rather than retreating or withdrawing) (9)

Energy level (i.e., mental functions that produce vigour and stamina) (10)

Motivation (i.e., mental functions that produce the incentive to act) (11)

Impulse control (i.e., mental functions that regulate and resist sudden intense urges to do something) (12)

Attention functions (i.e., functions of sustaining attention, shifting attention, dividing attention, sharing attention; concentration; distractibility) (13)

Memory functions (e.g., short-term memory, long-term memory, retrieval and processing of memory) (14)

Emotional functions (i.e., functions of appropriateness of emotion, regulation of emotion, and range of emotion) (15)

Basic cognitive functions (i.e., mental functions involved in acquisition of knowledge about objects, events and experiences; and the organization and application of that knowledge in tasks requiring mental activity) (16)

Higher-level cognitive functions (i.e., abstraction, organization and planning, time management, cognitive flexibility, insight, judgement, problem-solving) (17)

Reception of language (i.e., specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning) (18)

Expression of language (i.e., specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language) (19)

Calculation functions (i.e., specific mental functions of determination, approximation and manipulation of mathematical symbols and processes) (20)

Articulation functions (i.e., functions of the production of speech sounds) (21)

Fluency and rhythm of
speech functions (i.e.,
functions of the
production of flow and
tempo of speech) (22)



Page Break

Q14 Did we leave something out? If so, please list any other items (and for which educational level) that you think are ESSENTIAL.

End of Block: 2. PRIORITIZING ICF-CY CODES

Start of Block: Block 3

Thank you for taking the time to complete this survey. Your answers are extremely valuable. If you have any questions or comments, please contact Alexis Davis at batesa@live.unc.edu.

We will be contacting you in the next few weeks to complete a second round of the survey. Your continued participation is greatly appreciated and will contribute to the valid and meaningful construction of universal ICF-CY Education Code Sets.

End of Block: Block 3

ICF-CY Education Code Sets Survey 2

Start of Block: INTRODUCTION

Thank you for taking the time to participate in this study.

For the second round of the survey, only Survey 1 items that were endorsed by 60% or more of participants as essential were included. The items are arranged by educational level.

Please select codes you think are essential for each educational level.

End of Block: INTRODUCTION

Start of Block: 2. Education Code Set - Primary Education/Elementary School

Q1 Please rate whether or not each item should be included in the ICF-CY Education Code Set for children at the primary education/elementary school level.

1. Activity and Participation - Primary Education/Elementary School

	YES (1)	NO (2)
Watching (i.e., using the sense of seeing intentionally to experience visual stimuli) (1)	<input type="radio"/>	<input type="radio"/>
Listening (i.e., using the sense of hearing intentionally to experience auditory stimuli) (2)	<input type="radio"/>	<input type="radio"/>
Acquiring information (i.e., obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names) (3)	<input type="radio"/>	<input type="radio"/>
Acquiring syntax (i.e., learning to produce appropriately constructed sentences or set of sentences) (4)	<input type="radio"/>	<input type="radio"/>
Rehearsing (i.e., repeating a sequence of events or symbols as a basic component of learning) (5)	<input type="radio"/>	<input type="radio"/>
Acquiring concepts (i.e., developing competence to understand and use basic and complex related to the characteristics of things, persons or events) (6)	<input type="radio"/>	<input type="radio"/>
Learning to read (i.e., developing the competence to read written material with fluency and accuracy, such as recognizing characters and alphabets, sounding out written words with correct pronunciation, and understanding words and phrases) (7)	<input type="radio"/>	<input type="radio"/>
Learning to write (i.e., developing the competence to produce symbols that represent sounds, words or phrases in order to convey meaning) (8)	<input type="radio"/>	<input type="radio"/>
Learning to calculate (i.e., developing the competence to manipulate numbers and perform simple and complex mathematical operations) (9)	<input type="radio"/>	<input type="radio"/>

Acquiring complex skills (i.e., learning integrated sets of actions so as to follow rules and to sequence and coordinate one's movements, such as learning to play games and to use a building tool) (10)



Focusing attention (i.e., intentionally focusing on specific stimuli, such as by filtering out distracting noises) (11)



Directing attention (i.e., intentionally maintaining attention to specific actions or tasks for an appropriate length of time) (12)



Thinking (i.e., formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting) (13)



Reading (i.e., performing activities involved in the comprehension and interpretation of written language, for the purpose of obtaining general knowledge or specific information) (14)



Writing (i.e., using or producing symbols to language to convey information) (15)



Calculating (i.e., performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results) (16)



Making decisions (i.e., making a choice among options, implementing the choice, and evaluating the effects of the choice) (18)



Undertaking a single task (i.e., carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task, organizing time, space and materials for a task, pacing task performance, and carrying out, completing and sustaining a task) (19)



Carrying out daily routine (i.e., carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties) (21)



Managing one's own behaviour (i.e., carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences) (23)



Communicating with – receiving – spoken messages (i.e., comprehending literal and implied meanings of messages in spoken language) (24)



Communicating with – receiving – nonverbal messages (i.e., comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings) (25)



Speaking (i.e., producing words, phrases and longer passages in spoken messages with literal and implied meaning) (27)



Producing nonverbal messages (i.e., using gestures, symbols and drawings to convey messages) (28)



Fine hand use (i.e., performing coordinated actions of handling objects, picking up, manipulating and releasing them using one's hand, fingers and thumb) (33)



Basic interpersonal interactions
(i.e., interacting with people in a
contextually and socially
appropriate manner) (34)



Informal social relationships
(i.e., entering into relationships
with others, such as playmates)
(37)



Page Break

Q2

2. Environmental Factors - Primary Education/Elementary School

	YES (1)	NO (2)
Food (e.g., nutrition) (1)	<input type="radio"/>	<input type="radio"/>
Products and technology for personal use in daily living (e.g., furniture, chairs, personal care equipment, adapted or specially designed devices and orthopedic devices) (3)	<input type="radio"/>	<input type="radio"/>
Products and technology used for play (e.g., adapted materials for play indoors and playground/outside) (4)	<input type="radio"/>	<input type="radio"/>
Products and technology for personal indoor and outdoor mobility and transportation (e.g., adapted chairs, walking devices, wheelchair) (5)	<input type="radio"/>	<input type="radio"/>
Products and technology for communication (e.g., telephone, TV and video, computers, aids for sight and hearing, aids for writing) (6)	<input type="radio"/>	<input type="radio"/>
Products and technology for education (e.g., books, computers, educational toys, adapted material for learning such as computer software) (7)	<input type="radio"/>	<input type="radio"/>
Light (e.g., intensity and quality of sunlight or artificial lighting, which may provide useful or distracting information about the world) (8)	<input type="radio"/>	<input type="radio"/>
Sound (e.g., intensity and quality of sound, which may provide useful or distracting information about the world) (9)	<input type="radio"/>	<input type="radio"/>
Air quality [i.e., characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world] (10)	<input type="radio"/>	<input type="radio"/>
Immediate family (11)	<input type="radio"/>	<input type="radio"/>

Friends (13)	<input type="radio"/>	<input type="radio"/>
Personal care providers and personal assistance (e.g., nannies) (15)	<input type="radio"/>	<input type="radio"/>
Individual attitudes of immediate family members (16)	<input type="radio"/>	<input type="radio"/>
Health services, systems and policies (i.e., services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle) (21)	<input type="radio"/>	<input type="radio"/>
Education and training services, systems and policies (i.e., services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills) (22)	<input type="radio"/>	<input type="radio"/>

Page Break

Q3 3. Body Functions - Primary Education/Elementary School

	YES (1)	NO (2)
Consciousness functions (e.g., state of awareness and alertness) (1)	<input type="radio"/>	<input type="radio"/>
Intellectual functions (e.g., all cognitive functions and their development over the life span) (2)	<input type="radio"/>	<input type="radio"/>
Global psychosocial functions (e.g., lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions) (3)	<input type="radio"/>	<input type="radio"/>
Adaptability (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner) (4)	<input type="radio"/>	<input type="radio"/>
Responsivity (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner) (5)	<input type="radio"/>	<input type="radio"/>
Activity level (i.e., disposition to act or react with energy and action rather lethargy and inaction) (6)	<input type="radio"/>	<input type="radio"/>
Motivation (i.e., mental functions that produce the incentive to act) (11)	<input type="radio"/>	<input type="radio"/>
Impulse control (i.e., mental functions that regulate and resist sudden intense urges to do something) (12)	<input type="radio"/>	<input type="radio"/>
Attention functions (i.e., functions of sustaining attention, shifting attention, dividing attention, sharing attention; concentration; distractibility) (13)	<input type="radio"/>	<input type="radio"/>
Memory functions (e.g., short-term memory, long-term memory, retrieval and processing of memory) (14)	<input type="radio"/>	<input type="radio"/>
Emotional functions (i.e., functions of appropriateness of emotion, regulation of emotion, and range of emotion) (15)	<input type="radio"/>	<input type="radio"/>

Basic cognitive functions (i.e., mental functions involved in acquisition of knowledge about objects, events and experiences; and the organization and application of that knowledge in tasks requiring mental activity) (16)



Reception of language (i.e., specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning) (18)



Expression of language (i.e., specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language) (19)



Articulation functions (i.e., functions of the production of speech sounds) (21)



Page Break

End of Block: 2. Education Code Set - Primary Education/Elementary School

Start of Block: Education Code Set - Lower Secondary Education/Middle School

Q4 Please rate whether or not each item should be included in the ICF-CY Education Code Set for children at the lower secondary education/middle school level.

1. Activity and Participation - Lower Secondary Education/Middle School

	YES (1)	NO (2)
Watching (i.e., using the sense of seeing intentionally to experience visual stimuli) (1)	<input type="radio"/>	<input type="radio"/>
Listening (i.e., using the sense of hearing intentionally to experience auditory stimuli) (2)	<input type="radio"/>	<input type="radio"/>
Acquiring information (i.e., obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names) (3)	<input type="radio"/>	<input type="radio"/>
Acquiring concepts (i.e., developing competence to understand and use basic and complex related to the characteristics of things, persons or events) (6)	<input type="radio"/>	<input type="radio"/>
Acquiring complex skills (i.e., learning integrated sets of actions so as to follow rules and to sequence and coordinate one's movements, such as learning to play games and to use a building tool) (10)	<input type="radio"/>	<input type="radio"/>
Focusing attention (i.e., intentionally focusing on specific stimuli, such as by filtering out distracting noises) (11)	<input type="radio"/>	<input type="radio"/>
Directing attention (i.e., intentionally maintaining attention to specific actions or tasks for an appropriate length of time) (12)	<input type="radio"/>	<input type="radio"/>
Thinking (i.e., formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting) (13)	<input type="radio"/>	<input type="radio"/>

Reading (i.e., performing activities involved in the comprehension and interpretation of written language, for the purpose of obtaining general knowledge or specific information) (14)



Writing (i.e., using or producing symbols to language to convey information) (15)



Calculating (i.e., performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results) (16)



Solving problems (i.e., finding solutions to questions or situations by identifying and analyzing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution) (17)



Making decisions (i.e., making a choice among options, implementing the choice, and evaluating the effects of the choice) (18)



Undertaking multiple tasks (i.e., carrying out simple or complex and coordinated actions as components of multiple, integrated and complex tasks in sequence or simultaneously) (20)



Carrying out daily routine (i.e., carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties) (21)



Handling stress and other psychological demands (i.e., carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises) (22)



Managing one's own behaviour (i.e., carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences) (23)



Communicating with – receiving – spoken messages (i.e., comprehending literal and implied meanings of messages in spoken language) (24)



Communicating with – receiving – nonverbal messages (i.e., comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings) (25)



Communicating with – receiving – written messages (i.e., comprehending the literal and implied meanings of messages that are conveyed through written language) (26)



Speaking (i.e., producing words, phrases and longer passages in spoken messages with literal and implied meaning) (27)



Producing nonverbal messages (i.e., using gestures, symbols and drawings to convey messages) (28)



Writing messages (i.e., producing the literal and implied meanings of messages that are conveyed through written language) (29)



Conversation (i.e., starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with one or more persons one knows or who are strangers, in formal or casual settings) (30)



Discussion (i.e., starting, sustaining and ending an examination of a matter, with arguments for or against, or debate carried out by means of spoken, written, sign or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings) (31)



Using writing machines (e.g., using computers as means of communication) (32)



Basic interpersonal interactions (i.e., interacting with people in a contextually and socially appropriate manner) (34)



Complex interpersonal interactions (i.e., maintaining and managing interactions with other people, in a contextually and socially appropriate manner, such as by regulating emotions and impulses, controlling verbal and physical aggression, acting independently in social interactions, and acting in accordance with social rules and conventions) (35)



Informal social relationships (i.e., entering into relationships with others, such as playmates) (37)



School education (i.e., gaining admission to school, education; engaging in all school-related responsibilities and privileges; learning the course material, subject and other curriculum requirements in a primary or secondary education programme, including attending school regularly; working cooperatively with other students, taking direction from teachers, organizing, studying and completing assigned tasks and projects, and advancing to other stages of education) (38)



Page Break

Q5

2. Environmental Factors - Lower Secondary Education/Middle School

	YES (1)	NO (2)
Food (e.g., nutrition) (1)	<input type="radio"/>	<input type="radio"/>
Drugs (e.g., for medicinal purposes) (2)	<input type="radio"/>	<input type="radio"/>
Products and technology for personal use in daily living (e.g., furniture, chairs, personal care equipment, adapted or specially designed devices and orthopedic devices) (3)	<input type="radio"/>	<input type="radio"/>
Products and technology for personal indoor and outdoor mobility and transportation (e.g., adapted chairs, walking devices, wheelchair) (5)	<input type="radio"/>	<input type="radio"/>
Products and technology for communication (e.g., telephone, TV and video, computers, aids for sight and hearing, aids for writing) (6)	<input type="radio"/>	<input type="radio"/>
Products and technology for education (e.g., books, computers, educational toys, adapted material for learning such as computer software) (7)	<input type="radio"/>	<input type="radio"/>
Light (e.g., intensity and quality of sunlight or artificial lighting, which may provide useful or distracting information about the world) (8)	<input type="radio"/>	<input type="radio"/>
Sound (e.g., intensity and quality of sound, which may provide useful or distracting information about the world) (9)	<input type="radio"/>	<input type="radio"/>
Air quality [i.e., characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world] (10)	<input type="radio"/>	<input type="radio"/>
Immediate family (11)	<input type="radio"/>	<input type="radio"/>
Friends (13)	<input type="radio"/>	<input type="radio"/>

People in positions of authority
(14)



Individual attitudes of immediate
family members (16)



Individual attitudes of friends
(18)



Health services, systems and
policies (i.e., services, systems
and policies for preventing and
treating health problems,
providing medical rehabilitation
and promoting a healthy
lifestyle) (21)



Education and training services,
systems and policies (i.e.,
services, systems and policies
for the acquisition, maintenance
and improvement of knowledge,
expertise and vocational or
artistic skills) (22)



Page Break

Q6 3. Body Functions - Lower Secondary Education/Middle School

	YES (1)	NO (2)
Consciousness functions (e.g., state of awareness and alertness) (1)	<input type="radio"/>	<input type="radio"/>
Intellectual functions (e.g., all cognitive functions and their development over the life span) (2)	<input type="radio"/>	<input type="radio"/>
Global psychosocial functions (e.g., lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions) (3)	<input type="radio"/>	<input type="radio"/>
Adaptability (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner) (4)	<input type="radio"/>	<input type="radio"/>
Responsivity (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner) (5)	<input type="radio"/>	<input type="radio"/>
Activity level (i.e., disposition to act or react with energy and action rather lethargy and inaction) (6)	<input type="radio"/>	<input type="radio"/>
Predictability (i.e., disposition to act or react in a predictable and stable manner rather than an erratic or unpredictable manner) (7)	<input type="radio"/>	<input type="radio"/>
Persistence (i.e., disposition to act with an appropriately sustained rather than limited effort) (8)	<input type="radio"/>	<input type="radio"/>
Energy level (i.e., mental functions that produce vigour and stamina) (10)	<input type="radio"/>	<input type="radio"/>
Motivation (i.e., mental functions that produce the incentive to act) (11)	<input type="radio"/>	<input type="radio"/>
Impulse control (i.e., mental functions that regulate and resist sudden intense urges to do something) (12)	<input type="radio"/>	<input type="radio"/>

Attention functions (i.e., functions of sustaining attention, shifting attention, dividing attention, sharing attention; concentration; distractibility) (13)



Memory functions (e.g., short-term memory, long-term memory, retrieval and processing of memory) (14)



Emotional functions (i.e., functions of appropriateness of emotion, regulation of emotion, and range of emotion) (15)



Basic cognitive functions (i.e., mental functions involved in acquisition of knowledge about objects, events and experiences; and the organization and application of that knowledge in tasks requiring mental activity) (16)



Higher-level cognitive functions (i.e., abstraction, organization and planning, time management, cognitive flexibility, insight, judgement, problem-solving) (17)



Reception of language (i.e., specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning) (18)



Expression of language (i.e., specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language) (19)



Calculation functions (i.e., specific mental functions of determination, approximation and manipulation of mathematical symbols and processes) (20)



Page Break

End of Block: Education Code Set - Lower Secondary Education/Middle School

Start of Block: Education Code Set - Upper Secondary Education/High School

Q7 Please rate whether or not each item should be included in the ICF-CY Education Code Set for children at the upper secondary education/high school level.

1. Activity and Participation - Upper Secondary Education/High School

	YES (1)	NO (2)
Listening (i.e., using the sense of hearing intentionally to experience auditory stimuli) (2)	<input type="radio"/>	<input type="radio"/>
Acquiring information (i.e., obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names) (3)	<input type="radio"/>	<input type="radio"/>
Directing attention (i.e., intentionally maintaining attention to specific actions or tasks for an appropriate length of time) (12)	<input type="radio"/>	<input type="radio"/>
Thinking (i.e., formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting) (13)	<input type="radio"/>	<input type="radio"/>
Reading (i.e., performing activities involved in the comprehension and interpretation of written language, for the purpose of obtaining general knowledge or specific information) (14)	<input type="radio"/>	<input type="radio"/>
Writing (i.e., using or producing symbols to language to convey information) (15)	<input type="radio"/>	<input type="radio"/>
Calculating (i.e., performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results) (16)	<input type="radio"/>	<input type="radio"/>
Solving problems (i.e., finding solutions to questions or situations by identifying and analyzing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution) (17)	<input type="radio"/>	<input type="radio"/>

Making decisions (i.e., making a choice among options, implementing the choice, and evaluating the effects of the choice) (18)



Undertaking multiple tasks (i.e., carrying out simple or complex and coordinated actions as components of multiple, integrated and complex tasks in sequence or simultaneously) (20)



Carrying out daily routine (i.e., carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties) (21)



Handling stress and other psychological demands (i.e., carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises) (22)



Managing one's own behaviour (i.e., carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences) (23)



Communicating with – receiving – spoken messages (i.e., comprehending literal and implied meanings of messages in spoken language) (24)



Communicating with – receiving – nonverbal messages (i.e., comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings) (25)



Communicating with – receiving
– written messages (i.e.,
comprehending the literal and
implied meanings of messages
that are conveyed through written
language) (26)



Speaking (i.e., producing words,
phrases and longer passages in
spoken messages with literal
and implied meaning) (27)



Writing messages (i.e.,
producing the literal and implied
meanings of messages that are
conveyed through written
language) (29)



Conversation (i.e., starting,
sustaining and ending an
interchange of thoughts and
ideas, carried out by means of
spoken, written, sign or other
forms of language, with one or
more persons one knows or who
are strangers, in formal or
casual settings) (30)



Discussion (i.e., starting,
sustaining and ending an
examination of a matter, with
arguments for or against, or
debate carried out by means of
spoken, written, sign or other
forms of language, with one or
more people one knows or who
are strangers, in formal or
casual settings) (31)



Using writing machines (e.g.,
using computers as means of
communication) (32)



Complex interpersonal
interactions (i.e., maintaining
and managing interactions with
other people, in a contextually
and socially appropriate manner,
such as by regulating emotions
and impulses, controlling verbal
and physical aggression, acting
independently in social
interactions, and acting in
accordance with social rules and
conventions) (35)



Formal relationships (i.e., creating and maintaining specific relationships in formal settings) (39)



Informal social relationships (i.e., entering into relationships with others, such as playmates) (37)



School education (i.e., gaining admission to school, education; engaging in all school-related responsibilities and privileges; learning the course material, subject and other curriculum requirements in a primary or secondary education programme, including attending school regularly; working cooperatively with other students, taking direction from teachers, organizing, studying and completing assigned tasks and projects, and advancing to other stages of education) (38)



Page Break

Q8

2. Environmental Factors - Upper Secondary Education/High School

	YES (1)	NO (2)
Drugs (e.g., for medicinal purposes) (2)	<input type="radio"/>	<input type="radio"/>
Products and technology for personal use in daily living (e.g., furniture, chairs, personal care equipment, adapted or specially designed devices and orthopedic devices) (3)	<input type="radio"/>	<input type="radio"/>
Products and technology for personal indoor and outdoor mobility and transportation (e.g., adapted chairs, walking devices, wheelchair) (5)	<input type="radio"/>	<input type="radio"/>
Products and technology for communication (e.g., telephone, TV and video, computers, aids for sight and hearing, aids for writing) (6)	<input type="radio"/>	<input type="radio"/>
Products and technology for education (e.g., books, computers, educational toys, adapted material for learning such as computer software) (7)	<input type="radio"/>	<input type="radio"/>
Immediate family (11)	<input type="radio"/>	<input type="radio"/>
Friends (13)	<input type="radio"/>	<input type="radio"/>
Individual attitudes of extended family members (17)	<input type="radio"/>	<input type="radio"/>
Individual attitudes of friends (18)	<input type="radio"/>	<input type="radio"/>
Health services, systems and policies (i.e., services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle) (21)	<input type="radio"/>	<input type="radio"/>

Education and training services, systems and policies (i.e., services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills) (22)



Page Break

Q9 3. Body Functions - Upper Secondary Education/High School

	YES (1)	NO (2)
Consciousness functions (e.g., state of awareness and alertness) (1)	<input type="radio"/>	<input type="radio"/>
Intellectual functions (e.g., all cognitive functions and their development over the life span) (2)	<input type="radio"/>	<input type="radio"/>
Global psychosocial functions (e.g., lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions) (3)	<input type="radio"/>	<input type="radio"/>
Adaptability (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner) (4)	<input type="radio"/>	<input type="radio"/>
Activity level (i.e., disposition to act or react with energy and action rather lethargy and inaction) (6)	<input type="radio"/>	<input type="radio"/>
Predictability (i.e., disposition to act or react in a predictable and stable manner rather than an erratic or unpredictable manner) (7)	<input type="radio"/>	<input type="radio"/>
Persistence (i.e., disposition to act with an appropriately sustained rather than limited effort) (8)	<input type="radio"/>	<input type="radio"/>
Energy level (i.e., mental functions that produce vigour and stamina) (10)	<input type="radio"/>	<input type="radio"/>
Motivation (i.e., mental functions that produce the incentive to act) (11)	<input type="radio"/>	<input type="radio"/>
Impulse control (i.e., mental functions that regulate and resist sudden intense urges to do something) (12)	<input type="radio"/>	<input type="radio"/>
Attention functions (i.e., functions of sustaining attention, shifting attention, dividing attention, sharing attention; concentration; distractibility) (13)	<input type="radio"/>	<input type="radio"/>

Memory functions (e.g., short-term memory, long-term memory, retrieval and processing of memory) (14)



Emotional functions (i.e., functions of appropriateness of emotion, regulation of emotion, and range of emotion) (15)



Higher-level cognitive functions (i.e., abstraction, organization and planning, time management, cognitive flexibility, insight, judgement, problem-solving) (17)



Reception of language (i.e., specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning) (18)



Expression of language (i.e., specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language) (19)



Calculation functions (i.e., specific mental functions of determination, approximation and manipulation of mathematical symbols and processes) (20)



Page Break

End of Block: Education Code Set - Upper Secondary Education/High School

Start of Block: Open-ended responses from Survey 1

Q10 The following items were listed in the open-ended response section of Survey 1. Please review each item and indicate the educational level(s) (if any) to which it applies. Only mark items you think are ESSENTIAL to consider for the reduced item education code sets.

	Primary Education/Elementary School (1)	Lower Secondary Education/Middle School (2)	Upper Secondary Education/High School (3)
Transportation (2)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Recreation and leisure (3)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Going to school and back home by himself/herself (6)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Having lunch with friends (5)	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

End of Block: Open-ended responses from Survey 1

APPENDIX B: INVITATION EMAILS

B1 First Delphi Round Invitation Email

Hello,

My name is Alexis Davis and I am a doctoral candidate in the School of Education at the University of North Carolina at Chapel Hill (UNC-CH). I am writing to invite you to participate in a research study that I am conducting, under the supervision of Dr. Rune J. Simeonsson, to apply the *International Classification of Functioning, Disability and Health for Children and Youth* (ICF-CY) to the field of education. Specifically, the study will use a three-round Delphi study to derive three reduced sets of ICF-CY codes for applications in educational practice and policymaking. I would welcome your participation as you have been identified as a stakeholder in education and/or have experience with the ICF-CY in an international group of multidisciplinary experts.

Your participation in the study is voluntary. If you agree to take part in this research, your consent will be indicated by following the survey link provided and completing the survey. You may withdraw your consent to participate in the study by disconnecting the survey at any time, for any reason. You can choose not to answer any question you do not wish to answer.

As a Delphi study, you will be asked to assign ratings to items in 3 rounds of email surveys over the course of 3 months. Participation in the first survey should take no more than 30 minutes, 20 minutes for the second survey, and 15 minutes for the third survey. We expect that at least 100 professionals will take part in the study. **Please complete survey 1 by Saturday, November 30.**

If you know of anyone else who might be interested in participating in this research study, please forward their email addresses to me so that I can invite them to participate.

There are no known risks to you in taking part in this research. To protect your identity as a research participant, the research data will not be stored with your name and the researcher will not share your information with anyone. In any presentation or publication about this research, your name or other personal information will not be used.

Should you have any questions or desire further information, you can contact me, Alexis Davis, via email at batesa@live.unc.edu. This study has been approved by the Institutional Review Board (IRB) at the UNC-CH. If you have any questions about your rights as a research participant, or if you have any complaints or concerns about this study, you may contact my doctoral adviser, Rune J. Simeonsson, Ph.D., at rjsimeon@email.unc.edu or the UNC-CH IRB at 919-966-3113.

Thank you!

Alexis Davis, M.A.

Doctoral Candidate, School Psychology

University of North Carolina at Chapel Hill

B2 Second Delphi Round Invitation Email for Experts Who Participated in First Delphi Round

Hello,

Thank you for your participation in the first round of the Delphi study. Your response and those of many others were very helpful, allowing us to achieve the final reduced set of codes in two rounds rather than three. I would welcome your participation to complete the survey in round two of the study which should take no more than 20 minutes. **Please complete this survey by Saturday, February 15.**

Your continued participation in the study is voluntary. If you agree to take part in this research, your consent will be indicated by following the survey link provided and completing the survey. You may withdraw your consent to participate in the study by disconnecting the survey at any time, for any reason. You can choose not to answer any question you do not wish to answer.

If you know of anyone else who might be interested in participating in this research study, please forward their email addresses to me so that I can invite them to participate.

There are no known risks to you in taking part in this research. To protect your identity as a research participant, the research data will not be stored with your name and the researcher will not share your information with anyone. In any presentation or publication about this research, your name or other personal information will not be used.

Should you have any questions or desire further information, you can contact me, Alexis Davis, via email at batesa@live.unc.edu. This study has been approved by the Institutional Review Board (IRB) at the UNC-CH. If you have any questions about your rights as a research participant, or if you have any complaints or concerns about this study, you may contact my doctoral adviser, Rune J. Simeonsson, Ph.D., at rjsimeon@email.unc.edu or the UNC-CH IRB at 919-966-3113.

Thank you!
Alexis Davis, M.A.
Doctoral Candidate, School Psychology
University of North Carolina at Chapel Hill

B3 Second Delphi Round Invitation Email for Experts Who Did Not Participate in First Delphi Round

Hello,

My name is Alexis Davis and I am a doctoral candidate in the School of Education at the University of North Carolina at Chapel Hill (UNC-CH). I am writing to invite you to participate in a research study that I am conducting, under the supervision of Dr. Rune J. Simeonsson, to apply the *International Classification of Functioning, Disability and Health for Children and Youth* (ICF-CY) to the field of education. Specifically, the study will use a two-round Delphi study to derive three reduced sets of ICF-CY codes for applications in educational practice and policymaking. I would welcome your participation as you have been identified as a stakeholder in education and/or have experience with the ICF-CY in an international group of multidisciplinary experts.

Your participation in the study is voluntary. If you agree to take part in this research, your consent will be indicated by following the survey link provided and completing the survey. You may withdraw your consent to participate in the study by disconnecting the survey at any time, for any reason. You can choose not to answer any question you do not wish to answer.

You are participating in round two of this Delphi study. Participation in the survey should take no more than 20 minutes. We expect that at least 60 professionals will take part in the study. **Please complete this survey by Saturday, February 15.**

If you know of anyone else who might be interested in participating in this research study, please forward their email addresses to me so that I can invite them to participate.

There are no known risks to you in taking part in this research. To protect your identity as a research participant, the research data will not be stored with your name and the researcher will not share your information with anyone. In any presentation or publication about this research, your name or other personal information will not be used.

Should you have any questions or desire further information, you can contact me, Alexis Davis, via email at batesa@live.unc.edu. This study has been approved by the Institutional Review Board (IRB) at the UNC-CH. If you have any questions about your rights as a research participant, or if you have any complaints or concerns about this study, you may contact my doctoral adviser, Rune J. Simeonsson, Ph.D., at rjsimeon@email.unc.edu or the UNC-CH IRB at 919-966-3113.

Thank you!

Alexis Davis, M.A.

Doctoral Candidate, School Psychology

University of North Carolina at Chapel Hill

APPENDIX C: ICF-CY EDUCATION CODE SETS

Table C1

ICF-CY Education Code Set for Primary Education/Elementary School

	ACTIVITIES AND PARTICIPATION	CODE
1	Watching (i.e., using the sense of seeing intentionally to experience visual stimuli)	d110
2	Listening (i.e., using the sense of hearing intentionally to experience auditory stimuli)	d115
3	Acquiring information (i.e., obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names)	d132
4	Acquiring syntax (i.e., learning to produce appropriately constructed sentences or set of sentences)	d1332
5	Rehearsing (i.e., repeating a sequence of events or symbols as a basic component of learning)	d135
6	Acquiring concepts (i.e., developing competence to understand and use basic and complex related to the characteristics of things, persons or events)	d137
7	Learning to read (i.e., developing the competence to read written material with fluency and accuracy, such as recognizing characters and alphabets, sounding out written words with correct pronunciation, and understanding words and phrases)	d140
8	Learning to write (i.e., developing the competence to produce symbols that represent sounds, words or phrases in order to convey meaning)	d145
9	Learning to calculate (i.e., developing the competence to manipulate numbers and perform simple and complex mathematical operations)	d150
10	Acquiring complex skills (i.e., learning integrated sets of actions so as to follow rules and to sequence and coordinate one's movements, such as learning to play games and to use a building tool)	d1551
11	Focusing attention (i.e., intentionally focusing on specific stimuli, such as by filtering out distracting noises)	d160
12	Directing attention (i.e., intentionally maintaining attention to specific actions or tasks for an appropriate length of time)	d161
13	Thinking (i.e., formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting)	d163
14	Reading (i.e., performing activities involved in the comprehension and interpretation of written language, for the purpose of obtaining general knowledge or specific information)	d166
15	Writing (i.e., using or producing symbols to language to convey information)	d170

16	Calculating (i.e., performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results)	d172
17	Making decisions (i.e., making a choice among options, implementing the choice, and evaluating the effects of the choice)	d177
18	Undertaking a single task (i.e., carrying out simple or complex and coordinated actions related to the mental and physical components of a single task, such as initiating a task, organizing time, space and materials for a task, pacing task performance, and carrying out, completing and sustaining a task)	d210
19	Carrying out daily routine (i.e., carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties)	d230
20	Managing one's own behaviour (i.e., carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences)	d250
21	Communicating with – receiving – spoken messages (i.e., comprehending literal and implied meanings of messages in spoken language)	d310
22	Communicating with – receiving – nonverbal messages (i.e., comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings)	d315
23	Speaking (i.e., producing words, phrases and longer passages in spoken messages with literal and implied meaning)	d330
24	Producing nonverbal messages (i.e., using gestures, symbols and drawings to convey messages)	d335
25	Fine hand use (i.e., performing coordinated actions of handling objects, picking up, manipulating and releasing them using one's hand, fingers and thumb)	d440
26	Basic interpersonal interactions (i.e., interacting with people in a contextually and socially appropriate manner)	d710
27	Informal social relationships (i.e., entering into relationships with others, such as playmates)	d750
	ENVIRONMENTAL FACTORS	CODE
28	Food (e.g., nutrition)	e1100
29	Products and technology for personal use in daily living (e.g., furniture, chairs, personal care equipment, adapted or specially designed devices and orthopedic devices)	e115
30	Products and technology used for play (e.g., adapted materials for play indoors and playground/outside)	e1152
31	Products and technology for personal indoor and outdoor mobility and transportation (e.g., adapted chairs, walking devices, wheelchair)	e120
32	Products and technology for communication (e.g., telephone, TV and video, computers, aids for sight and hearing, aids for writing)	e125

33	Products and technology for education (e.g., books, computers, educational toys, adapted material for learning such as computer software)	e130
34	Light (e.g., intensity and quality of sunlight or artificial lighting, which may provide useful or distracting information about the world)	e240
35	Sound (e.g., intensity and quality of sound, which may provide useful or distracting information about the world)	e250
36	Air quality [i.e., characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world]	e260
37	Immediate family	e310
38	Friends	e320
39	Personal care providers and personal assistance (e.g., nannies)	e340
40	Individual attitudes of immediate family members	e410
41	Health services, systems and policies (i.e., services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle)	e580
42	Education and training services, systems and policies (i.e., services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills)	e585
	BODY FUNCTIONS	CODE
43	Consciousness functions (e.g., state of awareness and alertness)	b110
44	Intellectual functions (e.g., all cognitive functions and their development over the life span)	b117
45	Global psychosocial functions (e.g., lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions)	b122
46	Adaptability (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner)	b1250
47	Responsivity (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner)	b1251
48	Activity level (i.e., disposition to act or react with energy and action rather lethargy and inaction)	b1252
49	Motivation (i.e., mental functions that produce the incentive to act)	b1301
50	Impulse control (i.e., mental functions that regulate and resist sudden intense urges to do something)	b1304
51	Attention functions (i.e., functions of sustaining attention, shifting attention, dividing attention, sharing attention; concentration; distractibility)	b140
52	Memory functions (e.g., short-term memory, long-term memory, retrieval and processing of memory)	b144
53	Emotional functions (i.e., functions of appropriateness of emotion, regulation of emotion, and range of emotion)	b152

54	Basic cognitive functions (i.e., mental functions involved in acquisition of knowledge about objects, events and experiences; and the organization and application of that knowledge in tasks requiring mental activity)	b163
55	Reception of language (i.e., specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning)	b1670
56	Expression of language (i.e., specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language)	b1671
57	Articulation functions (i.e., functions of the production of speech sounds)	b320

Table C2

ICF-CY Education Code Set for Lower Secondary Education/Middle School

	ACTIVITIES AND PARTICIPATION	CODE
1	Watching (i.e., using the sense of seeing intentionally to experience visual stimuli)	d110
2	Listening (i.e., using the sense of hearing intentionally to experience auditory stimuli)	d115
3	Acquiring information (i.e., obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names)	d132
4	Acquiring concepts (i.e., developing competence to understand and use basic and complex related to the characteristics of things, persons or events)	d137
5	Acquiring complex skills (i.e., learning integrated sets of actions so as to follow rules and to sequence and coordinate one's movements, such as learning to play games and to use a building tool)	d1551
6	Focusing attention (i.e., intentionally focusing on specific stimuli, such as by filtering out distracting noises)	d160
7	Directing attention (i.e., intentionally maintaining attention to specific actions or tasks for an appropriate length of time)	d161
8	Thinking (i.e., formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting)	d163
9	Reading (i.e., performing activities involved in the comprehension and interpretation of written language, for the purpose of obtaining general knowledge or specific information)	d166
10	Writing (i.e., using or producing symbols to language to convey information)	d170
11	Calculating (i.e., performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results)	d172

12	Solving problems (i.e., finding solutions to questions or situations by identifying and analyzing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution)	d175
13	Making decisions (i.e., making a choice among options, implementing the choice, and evaluating the effects of the choice)	d177
14	Undertaking multiple tasks (i.e., carrying out simple or complex and coordinated actions as components of multiple, integrated and complex tasks in sequence or simultaneously)	d220
15	Carrying out daily routine (i.e., carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties)	d230
16	Handling stress and other psychological demands (i.e., carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises)	d240
17	Managing one's own behaviour (i.e., carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences)	d250
18	Communicating with – receiving – spoken messages (i.e., comprehending literal and implied meanings of messages in spoken language)	d310
19	Communicating with – receiving – nonverbal messages (i.e., comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings)	d315
20	Communicating with – receiving – written messages (i.e., comprehending the literal and implied meanings of messages that are conveyed through written language)	d325
21	Speaking (i.e., producing words, phrases and longer passages in spoken messages with literal and implied meaning)	d330
22	Producing nonverbal messages (i.e., using gestures, symbols and drawings to convey messages)	d335
23	Writing messages (i.e., producing the literal and implied meanings of messages that are conveyed through written language)	d345
24	Conversation (i.e., starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with one or more persons one knows or who are strangers, in formal or casual settings)	d350
25	Discussion (i.e., starting, sustaining and ending an examination of a matter, with arguments for or against, or debate carried out by means of spoken, written, sign or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings)	d355
26	Using writing machines (e.g., using computers as means of communication)	d3601
27	Basic interpersonal interactions (i.e., interacting with people in a contextually and socially appropriate manner)	d710

28	Complex interpersonal interactions (i.e., maintaining and managing interactions with other people, in a contextually and socially appropriate manner, such as by regulating emotions and impulses, controlling verbal and physical aggression, acting independently in social interactions, and acting in accordance with social rules and conventions)	d720
29	Informal social relationships (i.e., entering into relationships with others, such as playmates)	d750
30	School education (i.e., gaining admission to school, education; engaging in all school-related responsibilities and privileges; learning the course material, subject and other curriculum requirements in a primary or secondary education programme, including attending school regularly; working cooperatively with other students, taking direction from teachers, organizing, studying and completing assigned tasks and projects, and advancing to other stages of education)	d820
31	Recreation and leisure (i.e., engaging in any form of play, recreational or leisure activity, such as informal or organized play and sports, programmes of physical fitness, relaxation, amusement or diversion, going to art galleries, museums, cinemas or theatres; engaging in crafts or hobbies, reading for enjoyment, playing musical instruments; sightseeing, tourism and travelling for pleasure)	d920
	ENVIRONMENTAL FACTORS	CODE
32	Food (e.g., nutrition)	e1100
33	Drugs (e.g., for medicinal purposes)	e1101
34	Products and technology for personal use in daily living (e.g., furniture, chairs, personal care equipment, adapted or specially designed devices and orthopedic devices)	e115
35	Products and technology for personal indoor and outdoor mobility and transportation (e.g., adapted chairs, walking devices, wheelchair)	e120
36	Products and technology for communication (e.g., telephone, TV and video, computers, aids for sight and hearing, aids for writing)	e125
37	Products and technology for education (e.g., books, computers, educational toys, adapted material for learning such as computer software)	e130
38	Light (e.g., intensity and quality of sunlight or artificial lighting, which may provide useful or distracting information about the world)	e240
39	Sound (e.g., intensity and quality of sound, which may provide useful or distracting information about the world)	e250
40	Air quality [i.e., characteristics of the atmosphere (outside buildings) or enclosed areas of air (inside buildings), and which may provide useful or distracting information about the world]	e260
41	Immediate family	e310
42	Friends	e320

43	People in positions of authority	e330
44	Individual attitudes of immediate family members	e410
45	Individual attitudes of friends	e420
46	Health services, systems and policies (i.e., services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle)	e580
47	Education and training services, systems and policies (i.e., services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills)	e585
	BODY FUNCTIONS	CODE
48	Consciousness functions (e.g., state of awareness and alertness)	b110
49	Intellectual functions (e.g., all cognitive functions and their development over the life span)	b117
50	Global psychosocial functions (e.g., lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions)	b122
51	Adaptability (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner)	b1250
52	Responsivity (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner)	b1251
53	Activity level (i.e., disposition to act or react with energy and action rather lethargy and inaction)	b1252
54	Predictability (i.e., disposition to act or react in a predictable and stable manner rather than an erratic or unpredictable manner)	b1253
55	Persistence (i.e., disposition to act with an appropriately sustained rather than limited effort)	b1254
56	Energy level (i.e., mental functions that produce vigour and stamina)	b1300
57	Motivation (i.e., mental functions that produce the incentive to act)	b1301
58	Impulse control (i.e., mental functions that regulate and resist sudden intense urges to do something)	b1304
59	Attention functions (i.e., functions of sustaining attention, shifting attention, dividing attention, sharing attention; concentration; distractibility)	b140
60	Memory functions (e.g., short-term memory, long-term memory, retrieval and processing of memory)	b144
61	Emotional functions (i.e., functions of appropriateness of emotion, regulation of emotion, and range of emotion)	b152
62	Basic cognitive functions (i.e., mental functions involved in acquisition of knowledge about objects, events and experiences; and the organization and application of that knowledge in tasks requiring mental activity)	b163
63	Higher-level cognitive functions (i.e., abstraction, organization and planning, time management, cognitive flexibility, insight, judgement, problem-solving)	b164

64	Reception of language (i.e., specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning)	b1670
65	Expression of language (i.e., specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language)	b1671
66	Calculation functions (i.e., specific mental functions of determination, approximation and manipulation of mathematical symbols and processes)	b172

Table C3

ICF-CY Education Code Set for Upper Secondary Education/High School

	ACTIVITIES AND PARTICIPATION	CODE
1	Listening (i.e., using the sense of hearing intentionally to experience auditory stimuli)	d115
2	Acquiring information (i.e., obtaining facts about persons, things and events, such as asking why, what, where and how, asking for names)	d132
3	Directing attention (i.e., intentionally maintaining attention to specific actions or tasks for an appropriate length of time)	d161
4	Thinking (i.e., formulating and manipulating ideas, concepts, and images, whether goal-oriented or not, either alone or with others, with types of thinking activities, such as pretending, playing with words, creating fiction, proving a theorem, playing with ideas, brainstorming, meditating, pondering, speculating or reflecting)	d163
5	Reading (i.e., performing activities involved in the comprehension and interpretation of written language, for the purpose of obtaining general knowledge or specific information)	d166
6	Writing (i.e., using or producing symbols to language to convey information)	d170
7	Calculating (i.e., performing computations by applying mathematical principles to solve problems that are described in words and producing or displaying the results)	d172
8	Solving problems (i.e., finding solutions to questions or situations by identifying and analyzing issues, developing options and solutions, evaluating potential effects of solutions, and executing a chosen solution)	d175
9	Making decisions (i.e., making a choice among options, implementing the choice, and evaluating the effects of the choice)	d177
10	Undertaking multiple tasks (i.e., carrying out simple or complex and coordinated actions as components of multiple, integrated and complex tasks in sequence or simultaneously)	d220
11	Carrying out daily routine (i.e., carrying out simple or complex and coordinated actions in order to plan, manage and complete the requirements of day-to-day procedures or duties)	d230

12	Handling stress and other psychological demands (i.e., carrying out simple or complex and coordinated actions to manage and control the psychological demands required to carry out tasks demanding significant responsibilities and involving stress, distraction, or crises)	d240
13	Managing one's own behaviour (i.e., carrying out simple or complex and coordinated actions in a consistent manner in response to new situations, persons or experiences)	d250
14	Communicating with – receiving – spoken messages (i.e., comprehending literal and implied meanings of messages in spoken language)	d310
15	Communicating with – receiving – nonverbal messages (i.e., comprehending the literal and implied meanings of messages conveyed by gestures, symbols and drawings)	d315
16	Communicating with – receiving – written messages (i.e., comprehending the literal and implied meanings of messages that are conveyed through written language)	d325
17	Speaking (i.e., producing words, phrases and longer passages in spoken messages with literal and implied meaning)	d330
18	Writing messages (i.e., producing the literal and implied meanings of messages that are conveyed through written language)	d345
19	Conversation (i.e., starting, sustaining and ending an interchange of thoughts and ideas, carried out by means of spoken, written, sign or other forms of language, with one or more persons one knows or who are strangers, in formal or casual settings)	d350
20	Discussion (i.e., starting, sustaining and ending an examination of a matter, with arguments for or against, or debate carried out by means of spoken, written, sign or other forms of language, with one or more people one knows or who are strangers, in formal or casual settings)	d355
21	Using writing machines (e.g., using computers as means of communication)	d3601
22	Complex interpersonal interactions (i.e., maintaining and managing interactions with other people, in a contextually and socially appropriate manner, such as by regulating emotions and impulses, controlling verbal and physical aggression, acting independently in social interactions, and acting in accordance with social rules and conventions)	d720
23	Formal relationships (i.e., creating and maintaining specific relationships in formal settings)	d740
24	Informal social relationships (i.e., entering into relationships with others, such as playmates)	d750
25	School education (i.e., gaining admission to school, education; engaging in all school-related responsibilities and privileges; learning the course material, subject and other curriculum requirements in a primary or secondary education programme, including attending school regularly; working cooperatively with other students, taking direction from teachers, organizing, studying and completing assigned tasks and projects, and advancing to other stages of education)	d820

	ENVIRONMENTAL FACTORS	CODE
26	Drugs (e.g., for medicinal purposes)	e1101
27	Products and technology for personal use in daily living (e.g., furniture, chairs, personal care equipment, adapted or specially designed devices and orthopedic devices)	e115
28	Products and technology for personal indoor and outdoor mobility and transportation (e.g., adapted chairs, walking devices, wheelchair)	e120
29	Products and technology for communication (e.g., telephone, TV and video, computers, aids for sight and hearing, aids for writing)	e125
30	Products and technology for education (e.g., books, computers, educational toys, adapted material for learning such as computer software)	e130
31	Immediate family	e310
32	Friends	e320
33	Individual attitudes of friends	e420
34	Health services, systems and policies (i.e., services, systems and policies for preventing and treating health problems, providing medical rehabilitation and promoting a healthy lifestyle)	e580
35	Education and training services, systems and policies (i.e., services, systems and policies for the acquisition, maintenance and improvement of knowledge, expertise and vocational or artistic skills)	e585
	BODY FUNCTIONS	CODE
36	Consciousness functions (e.g., state of awareness and alertness)	b110
37	Intellectual functions (e.g., all cognitive functions and their development over the life span)	b117
38	Global psychosocial functions (e.g., lead to the formation of the personal and interpersonal skills needed to establish reciprocal social interactions)	b122
39	Adaptability (i.e., disposition to act or react to new objects or experiences in an accepting manner rather than a resistant manner)	b1250
40	Activity level (i.e., disposition to act or react with energy and action rather lethargy and inaction)	b1252
41	Predictability (i.e., disposition to act or react in a predictable and stable manner rather than an erratic or unpredictable manner)	b1253
42	Persistence (i.e., disposition to act with an appropriately sustained rather than limited effort)	b1254
43	Energy level (i.e., mental functions that produce vigour and stamina)	b1300
44	Motivation (i.e., mental functions that produce the incentive to act)	b1301
45	Impulse control (i.e., mental functions that regulate and resist sudden intense urges to do something)	b1304
46	Attention functions (i.e., functions of sustaining attention, shifting attention, dividing attention, sharing attention; concentration; distractibility)	b140

47	Memory functions (e.g., short-term memory, long-term memory, retrieval and processing of memory)	b144
48	Emotional functions (i.e., functions of appropriateness of emotion, regulation of emotion, and range of emotion)	b152
49	Higher-level cognitive functions (i.e., abstraction, organization and planning, time management, cognitive flexibility, insight, judgement, problem-solving)	b164
50	Reception of language (i.e., specific mental functions of decoding messages in spoken, written or other forms, such as sign language, to obtain their meaning)	b1670
51	Expression of language (i.e., specific mental functions necessary to produce meaningful messages in spoken, written, signed or other forms of language)	b1671
52	Calculation functions (i.e., specific mental functions of determination, approximation and manipulation of mathematical symbols and processes)	b172

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