Investigating Practical Knowledge Base (PKB) of Special Education Teachers: The Case of Teaching Individuals with Down Syndrome (IDS) in the English as a Foreign Language (EFL) Context of Iran

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Abstract: Investigating teachers' cognitions, both in general education and in language teaching, has gained momentum in the past few decades. Yet, the practical knowledge-base (PKB) of practitioners who teach languages to students with special needs has not been amply explored. The present study aimed to investigate the personal PKB of EFL teachers of individuals with Down syndrome (IDS). To this end, several classes of three Iranian EFL special education teachers were observed and video-recorded, and the teachers were interviewed using the stimulated-recall method. Analysing the data resulted in the emergence and conceptualization of a framework characterizing the PKB of Iranian EFL special-education teachers in terms of eight major knowledge types: knowledge of learners' characteristics, learner-based pedagogical knowledge, knowledge of classroom management, visual-impact knowledge, knowledge of self, curriculum knowledge, language subject knowledge, and contextual knowledge. These knowledge types and particularly their subcomponents are argued to be heavily reminiscent of the teachers' learner-centered (vs. content-oriented) attention to their students' special needs, characteristics, motivations, limitations, potentials, and deprivations. Dealing with an under-researched domain, the study is hoped to sensitize ELT special-education teachers, teacher trainers, and policy-makers to the possibilities and requirements of quality teaching to IDS.

Keywords: Iranian Teachers, Cognition, Learner-centered Pedagogy, Special-Education Teacher Educators, Stimulated Recall.

Introduction

More and more private and public institutions for educating students with special needs are eager to integrate language teaching in their curricula due to the role it might play in enhancing the cognitive abilities and life quality of the students (Buckley, 2002; Burgoyne, Duff, Nielsen, Ulicheva, & Snowling, 2016). Being among the Cinderella domains of ELT, teaching language to individuals with special needs including individuals with Down Syndrome (henceforth IDS) can pose several questions and uncertainties, though.

One problem is recruiting language teachers who are competent and motivated enough to work in these contexts. Another related problem is a paucity of credible investigations and data to inform special language teacher education programs; specifically, there is now a thriving body of research on the practical knowledge-base (PKB) of both general education and special education teachers (e.g. Chaharbashloo, Gholami, Aliasgari, Talebzadeh & Mousapour,, 2020; Nougaret, Scruggs, & Mastropieri, 2005) as well as language teachers (Akbari & Dadvand, 2014; Akbari, Dadvand, Samar, & Kiany, 2012; Chappell, 2017; Moradkhani, 2017 among others); nevertheless, there is still much to learn about the prerequisite competencies, challenges, and components of knowledge of practicing special education language teachers. Particularly, we still have a lot to learn about those who have to teach English in foreign language contexts with several (implicit or explicit) biases against IDS (and even their teachers) and the difficulties they would face.

Therefore, as a step toward equipping practicing and aspiring special education teachers, this study intends to shed more light on the requirements and obstacles of teaching foreign languages to IDS through exploring the personal PKBs of three special education language teachers.

Review of the Literature

Individuals with Down Syndrome

According to Abbeduto, Chapman, Fletcher, and Miller (2005) "Down syndrome results from a third copy of all or part of chromosome 21, with its attendant consequences of gene dosage effects on fetal development, physiology, and brain functioning" (p. 54). There are a number of language-related features associated with IDS. They are usually weak at (spoken) language development (Barker & Romski, 2009), as they cannot talk easily and fluently compared to their cognitive development (Roberts, Chapman, & Warren, 2008). Moreover, children with Down syndrome are efficient (non-verbal) communicators since an early age and are good at vocabulary (especially comprehension), but weak at grammar (and morphology) (e.g. Buckley, 2002; Fowler, 1990).

Despite following an order and pattern of mother tongue acquisition more or less similar (in terms of spoken language skills, vocabulary, and grammar) to typically developing kids, the speed of learning of IDS is slower than that of normal children (see e.g. Buckley, 2002; Chapman & Hesketh, 2000; Tager-Flusberg, Calkins, Nolin, Baumberger, Anderson & Chadwick-Dias, 1990).

Several of their linguistic difficulties are related to other physical or cognitive challenges IDS experience such as early loss of hearing and subsequent speech sound discrimination in early childhood, difficulty in learning and storing phonological representations, and inadequate linguistic input and opportunities to hear and talk (Down Syndrome Education (DSE) n.d.). As a result of ample exposure to language and practice, nevertheless, they can overcome some of these language-related difficulties later in life (DSE, n.d.). There are also studies that show they can learn other languages without negative effects on the mother tongue (Buckley, 2002; Burgoyne, Duff, Nielsen, Ulicheva & Snowling, 2016).

The above-mentioned problems, then, can create some challenges and problems in educating IDS. As McFadden (2014) noted, among the issues in teaching IDS are resourcing, time constraints, support issues, and additional planning requirements (pp. 13-14). Nevertheless, IDS should not only be allowed and supported to be educated in their mother tongue but they also should be provided with some opportunities to learn a foreign language. There might be some conceivable positive effects associated with learning a foreign language by IDS (as will be noted later), not to mention their right to be educated in general and to learn a foreign language in particular (Javadnia & Tahzibi, 2012, p. 184).

Another controversial issue is IDS' regular education and study with normal children which may have positive effects, and in some situations can even improve their social skills. Laws, Byrne, and Buckley (2000) compared IDS who attended normal schools with IDS who attended special schools in England. The performance and memory of IDS who attended normal schools improved more than IDS who attended special schools. However, in non-verbal skills, no significant difference was found. It might be argued, however, that integrative regular education for IDS is hard to implement in the Iranian context. This can be attributed in part to the teachers' probable lack of experience in teaching IDS as well as the probable dominant general public attitudes and the perceptions and pessimism of IDS' parents. Moreover, one of the likely reasons why some normal-education teachers refuse to welcome IDS is that many teachers may not know how to treat these kids, not know the developmental patterns of these children, and not know how IDS' school year would progress (Johnson, 2006, pp. 24-25). These issues, in general, point to one of the major gaps in the teacher education literature, namely, the knowledge base of special education teachers.

General and EFL Teacher Knowledge Base

Highlighting the myriad of terms used in the literature on teachers' practical knowledge (e.g. teachers' practical knowledge, personal practical knowledge, craft knowledge, professional craft knowledge, pedagogical (content) knowledge, or implicit theories, among others), Chaharbashloo, et al. (2020, p. 2) define it as "the basic knowledge teachers utilize to act ….as the practitioners' knowledge of the classroom situation and practical constraints they confront while teaching" originating "from the events of the classroom environment and teaching context". Accordingly, we follow Chaharbashloo, et al.'s (2020, p. 2) characterization of teachers' practical knowledge in terms of being "personal (each teacher's practical knowledge is to some extent unique); contextual (bounded in and adapted to the classroom situation); reflective (it originates in, and develops through, experiences in teaching); tacit (i.e. not often articulated by teachers); it guides teaching practice, and it is content-related" (p. 3).

Considering these issues especially the context-bound nature of teacher knowledge, several conceptualizations of the components of teacher knowledge have been proposed in the pertinent literature of general education (Shulman, 1987; Grossman, 1990; Chaharbashloo, et al., 2020), second and foreign language education (Akbari & Dadvand, 2014; Moradkhani, 2017; Chappell, 2017), and special education (Nougaret et al., 2005; Stough, Palmer, & Leyva, 1998).

Shulman (1987) conceptualized the general definition of the components of the pedagogical-content knowledge base as 1) knowledge of the subject matter taught frequently within the class, 2) knowledge of the ways of presenting, and 3) knowledge of students' understanding of the topics. Although Shulman is among the first scholars who used pedagogical content knowledge, his framework is just limited to teachers' understanding of the above-mentioned three issues and other aspects of teaching seem to be underrepresented in the model.

Another important teacher knowledge base framework is that of Grossman (1990). Grossman's (1990) pedagogical content knowledge framework has four central components:

1) Conception of teaching purposes (i.e. knowledge and beliefs about the purposes for teaching a subject at different grade levels), 2) knowledge of students, including students' understanding, conceptions, and misconceptions of particular topics in a subject matter, 3) curricular knowledge, including the knowledge of available curricular teaching material and knowledge both of the subject's vertical and horizontal curricula, as well as of 4) knowledge

of the teaching method and of different thematic representations (pp. 97-98).

Chaharbashloo, et al.'s (2020) in-depth analysis of the practical knowledge-base of teachers, rooted in almost all the stringent previous models and frameworks, is conducted in the context of Iranian primary schools in the post-reform era and shows that teacher's practical knowledge can be conceptualized in terms of eight components and their pertinent sub-components: 1) Knowledge of Subject Matter, 2) Knowledge of the Learners, 3) Knowledge of Curriculum, 4) Classroom Management, 5) Knowledge of Desirable Learning Environments, 6) Pedagogical Knowledge, 7) Knowledge of School Context, and 8) Knowledge of Self.

Dealing with the context of teaching, including EFL contexts, Akbari et al. (2012) observed that previously "teachers' agency and mentality, or what later on came to be known as teachers' mental lives (Walberg, 1977) was totally ignored" because "the teachers were supposed to enter the teaching profession with a tabula rasa and through a training program the required teaching skills and habits were to be mastered." (p. 52). The fortunate later orientation towards more cognitive and social approaches to teaching paved the way for investigating the content of teachers' cognition and their mental lives including the studies on Iranian EFL language teachers' knowledge-base (e.g. Akbari & Dadvand, 2014; Akbari et al., 2012; Ebrahimzadeh & Talebzadeh, 2021; Mahmoudi, Rashtchi, & Abbasian, 2021; Moradkhani, 2017; Yazdanmehr, Akbari, & Kiany, 2020). For instance, Akbari and Dadvand (2014) demonstrate that the pedagogical knowledge of EFL teachers comprises: 1) Knowledge of Language, 2) Knowledge of Language Teaching, 3) Knowledge of Language Learning, 4) Knowledge of Classroom Management, and 5) Knowledge of Students.

Special-Education Teacher Knowledge Base

Ortiz and Robertson (2018) drew upon their own previous studies as well as the pertinent literature to identify "the knowledge and skills teachers must have to create the positive school climate for E[nglish] L[earner]s … and, thus, the competencies that must be integrated into teacher education programs that prepare candidates to serve ELs, including ELs with language- and/or literacy-related difficulties or disabilities" (p. 3). Their recommended list includes a wide range of competencies and their sub-categories as follows: language and linguistics, cultural variability, learner development and individual differences, educational contexts, literacy foundations, assessment, instruction/intervention, collaboration, and professional and ethnical practice. Along the same line of research, Fisher, Frey, and Thousand (2003) draw on

the major roles of the special educator in an inclusive school (such as instruction, assessment, communication, leadership, and record-keeping) to recommend the following list of specialized skills, knowledge, and beliefs required for special educators to promote inclusive schooling: collaborative teaming and teaching, curricular and instructional modifications and accommodations, assistive technology, positive behavioural support, personal support, and literacy and content instruction. While both their recommended frameworks appear to be exhaustive, they might not be adequate PKB frameworks that specifically emerged out of the exploration of the cognitions or situational practices of special education or IDS learners, nor are they attuned to the specific context of Iranian students and teachers (which is not an inclusive education context).

While there is a paucity of studies that explicitly tap into the knowledge base of special education teachers, among the studies that are closest in scope to this domain are that of Stough et al. (1998) and Nougaret et al. (2005). As one of the early studies of expert special educators, Stough et al. (1998) observed and interviewed (through stimulated recall technique) 20 special education teachers from different instructional settings in order to explore the cognition of these groups of teachers. Their in-depth analysis resulted in the following teacher knowledge categories (each of which comprising of several sub-categories): 1) Student Characteristics (ability characteristics such as motivation, intelligence level, memory, diagnostic category, and achievement level, students' emotional characteristics as well their home life and experiences), 2) Instructional Strategies (e.g. repetition, scaffolding, and different sensory modalities, along with behavioural strategies, classroom management, and modification), 3) Teacher Knowledge (of students and their characteristics as well as of content knowledge), 4) Student Knowledge and Learning (reflection on students' prior knowledge and the learning task at hand), 5) Classroom Management; (structure of the classroom through rules, the routine of the classroom, the seating arrangement, and the overall classroom environment), 6) Monitoring Behaviour and Academics (monitoring individual or group level of involvement and participation in a task along with compliance with classroom procedures and routines; also monitoring students' understanding of the content), and 7) Instructional Diagnosis (diagnosing the student's ability to successfully engage in the task at hand) (Stough et al., 1998).

Nougaret et al. (2005) explored the effectiveness of special education teachers' teaching practice with the aim of comparing "twenty traditionally licensed first-year teachers and 20 first-year teachers with emergency provisional licensure" (p. 217). The rating scale they utilized is inspired by general education categories of teaching knowledge which is divided

into three categories, namely, planning and preparation, classroom management, and instruction. The major components are in turn divided into several sub-components which are argued, based on the observation of special education teachers, to have a substantial role in promoting teaching effectiveness: 1) demonstration knowledge of content and pedagogy, demonstrating knowledge of students, selecting instructional goals, demonstrating knowledge of resources, designing coherent instruction, and assessing student learning, 2) creating an environment of respect and rapport, establishing a culture for learning, managing classroom procedures, managing student behaviour, and organizing physical space, and 3) communicating clearly and accurately, using questioning and discussion techniques, engaging students in learning, providing feedback to students, and demonstrating flexibility and responsiveness (Nougaret, et al., 2005). There, however, appears to be no international frameworks dedicated to language teachers of individuals with special needs in general and IDS in particular.

Although there are many Iranian investigations of special education teachers with regards to diverse correlated variables such as their self-efficacy, burn-out, job adjustment, job hardship, religiosity, resilience, negative and positive affect, and emotional regulation (e.g. Asghari, Sadri, & Panah Ali, 2016; Babaei, Sajjadi, & Askarizadeh, 2020; Barzegar Befroui, 2015; Momeni, Moullaei Pardeh, & Abbasian, 2019), there is still a dearth of studies with a focus on their PKB. One Iranian study that implicitly points to the significance of the distinctive underlying knowledge base of special education teachers is the research by Behpajouh and Torabi (2008). In their study, they revealed that the attitude of special education teachers towards blind students and their educational integration is significantly more positive than the attitude of ordinary teachers. It is argued that inasmuch as the special education teachers have more in-service training, a higher level of education, and are younger, they have developed a more positive attitude towards children with special needs compared to their peers.

Actually, there are also comparatively very few studies that specifically address the teaching of (first and second) language to Iranian children with special needs and Down syndrome. Apart from the studies noted above, one study dealing with the teaching of language skills to IDSs is the research by Dehghan, Yadegari, Sima Shirazi, and Kazem Nejad (2008). They showed that teaching reading through the whole reading method can have a better effect on the cognitive, expressive, and spoken language of children with Down syndrome than the traditional teaching method. In other words, examining the behavioural and cognitive phenotype of Down children, they conclude that the visual pathway appears to facilitate the learning of spoken language more than the auditory pathway, and the best results can be

obtained with the approach of teaching talents (Dehghan et al., 2008). While addressing the teaching of language skills, it is not by any means related to the teachers' cognitions.

Finally, though not particularly aiming at the PKB of special education teachers, the mixed-method research conducted by Jafari, Abolghasemi, Ghahramani, and Khorasani (2017) is among the very few domestic studies that intended to determine Iranian special education teachers' organizational and contextual factors of professional development. After qualitative and quantitative analyses of the data collected through semi-structured interviews and questionnaires from 15 and 200 elementary "school teachers of students with mental retardation in Tehran" (p. 73), they concluded that eight components affect the professional development of these teachers. They were reported to be as follows: students and their learning needs, teachers and their learning needs, norms of the educational system, organizational culture, curriculum and instruction system, national and local policies, financial and time resources, families and communities, school management, and learning environments (Jafari et al., 2017). While being a meaningful step forward in understanding the contextual and organizational factors affecting the professional development of special education teachers in Iran, Jafari et al.'s (2017) research cannot sufficiently determine the components of special education (including IDS) teachers' PKB.

In general, as far as the Iranian context is concerned (as noted above), teaching English to IDS can have its own context-specific challenges. These challenges may require Iranian EFL special education teachers to have particular characteristics and a particular teacher knowledge base. However, there is relatively little information regarding the teacher knowledge bases of Iranian EFL special-education teachers, and the challenges that these teachers face in teaching IDS. Given the scarcity of investigations of EFL special education teachers, at least in our domestic context, the current study attempts to explore the features that could characterize the PKB of Iranian EFL practitioners who teach IDS.

Methodology

Context and Participants

As far as the context of the study is concerned, apart from the state and private schools, several (non-profit and for-profit) organizations and institutions provide educational services to individuals with special needs in Iran. Generally, such students, including Down Syndrome children, are not accepted in regular schools and have problems attending regular language institutions, too. Plus, there are no exclusive teacher-preparation courses as well as language

teaching materials for students with special mental/cognitive challenges.

Table 1. *Demographics of the Participating Teachers*

Participant	Gender	Age	Years of teaching experience	Grades Taught	Number of Students	Education and/or Qualification
Teacher 1	Female	42	3 years (two years with Normal students – one year with *IDS)	Young Learners	6	MA in TEFL
Teacher 2	Female	30	2 years (One year with *IDS)	Young Learners	14	BA in computer engineering; Education Ministry Staff; Attended various English Courses
Teacher 3	Female	38	8 years (five years with Normal students – 3 years with *IDS)	Young and Adult Learners	10	MA in English Literature; Former ILI (Iran Language institute) instructor

*IDS: Individuals with Down Syndrome

The participants of this study were 3 Iranian female EFL special-education teachers who were teaching IDS English, as one component of the curriculum of the school the learners attended in Tehran (Iran's capital), Rasht, and Lahijan (two cities in northern Guilan province). While they had two, three, and eight years of teaching experience, their professional experience with IDS language classes was one year, one year, and five years, respectively. The teachers were 42, 30, and 38 years old. The first and third teachers had an MA in English Language Teaching and English Literature and their own children were IDS, while the third language teacher who was employed by the ministry of education was a computer engineering graduate who had close relatives with Down Syndrome (see Table 1). The participating teachers were selected by purposeful and convenience sampling methods. As there were few students in each school, the learners were taught in coeducational classes (in contrast to regular Iranian schools) and the students were of diverse chronological and mental ages (see Table 2 for the details of

their gender, socio-economic status, biological age, and school grade as either documented by the school officials or their teachers).

Table 2. *Demographics of the IDS Students Attending the Observed Classes*

Participant	Gender	Family Social Class	Biological age	School Grade
Student 1	Boy	Upper Class	18	Diploma
Student 2	Boy	Middle Class	16	7th
Student 3	Girl	Working Class	12	5th
Student 4	Girl	Working Class	12	5th
Student 5	Boy	Middle Class	11	6th
Student 6	Boy	Working Class	16	7th
Student 7	Girl	Middle Class	18	Diploma
Student 8	Boy	Working	16	7th
Student 9	Boy	Upper Class	20	Diploma
Student 10	Boy	Middle Class	34	Had not gotten Diploma
Student 11	Boy	Working Class	16	7th
Student 12	Girl	Working Class	12	5th
Student 13	Girl	Middle Class	15	5th
Student 14	Boy	Upper Class	18	Had not gotten Diploma
Student 15	Girl	Middle Class	8	2nd
Student 16	Boy	Middle Class	30	Had not gotten Diploma
Student 17	Girl	Middle Class	18	11th
Student 18	Girl	Working Class	15	7th
Student 19	Boy	Working Class	35	Had not gotten Diploma
Student 20	Boy	Middle Class	30	Diploma

Student 21	Boy	Middle Class	28	8th
Student 22	Girl	Working Class	18	Diploma
Student 23	Boy	Upper Class	16	7th
Student 24	Girl	Middle Class	16	7th
Student 25	Girl	Middle Class	8	2nd
Student 26	Girl	Middle Class	17	7th
Student 27	Boy	Upper Class	18	Diploma
Student 28	Boy	Working Class	40	Had not gotten Diploma
Student 29	Boy	Middle Class	12	5th
Student 30	Boy	Working Class	17	7th

Procedure

The data were collected through detailed observation of the only accessible IDS classes in each city for at least five times. In fact, one serious limitation of the study (maybe originating from the challenges of special education in Iran) was the reluctance of the teachers and/or school officials in granting access to their classes. Apart from shadowing the teachers, all observed classes were video-recorded while the observing researcher took notes, too. After each observation, the teachers were interviewed using the stimulated-recall method. "The stimulated recall interviews," following Chaharbashloo, et al. (2020, p. 5), "aimed at gathering relevant data about teachers' underlying thought processes, actions, and decisions (Vesterinen, Toom & Patrikainen, 2010)". Being incentivized by the need to explore the knowledge base of special education language teachers, the researchers went through their observation notes and the class recordings and looked for any classroom incident which could shed some light on the diverse, new aspects of the underexplored domain of teaching English to the IDS. Consequently, the interview questions inquired about the teachers' (and their students') background, classroom procedures, practices, beliefs, reflections, and justifications for particular activities, assignments, and behaviours as well as their attitudes to teaching English to IDS and their challenges. It should be mentioned that the interview questions, apart from the observations of the classroom practices and videos, were generally inspired by the pertinent literature and their

relevance to the special education teachers' knowledge (for more details of the data collection for PKB see Chaharbashloo, et al., 2020; Moradkhani, 2017; Akbari et al., 2012).

Data Analysis

After a comprehensive review of the existing frameworks and transcribing the interview contents, the raw data collected from stimulated recall interviews and observations were sifted through, and open codes (first level) were determined. Afterward, in the axial coding stage, common themes were determined, which in turn, resulted in the third level or the selective codes (i.e. the PKB components in our suggested model). The process of coding was conducted iteratively; the researchers reviewed the data a number of times, and they re-analyzed problematic and/or fuzzy cases. The analyses were done several times until the best category could be determined and attempts were made to ensure inter-coder and intra-coder consistency of the categories.

Results and Discussion

PKB Framework for EFL Special Education Teachers of IDS

Upon analysing the data, we could conceptualize the content of EFL special-education teachers' knowledge in terms of eight major categories and their sub-categories. While there are overlaps with previous frameworks (e.g. Akbari et al., 2012; Akbari & Dadvand, 2014; Chaharbashloo, et al., 2020; Nougaret et al., 2005; Stough et al., 1998; Yazdanmehr et al., 2020), some new emergent components and sub-components contributed to the formation of a new teacher PKB framework for Iranian EFL special-education teachers teaching IDS (Table 3). We list all the categories but will just elaborate on those components and sub-components that could better set apart special education language teachers from their peers.

Table 3. *The Suggested Framework for the Knowledge Base of Iranian EFL Special-education Teachers*

Components	Sub-components		
Knowledge of learners' characteristics	Knowledge of learners' cognitive characteristics	Knowledge of learners' psychological/emotional/behavioral characteristics	Knowledge of learners' physical/developmental characteristics
Learner-based pedagogical knowledge	Familiarity with teaching methods	Intuitive understanding of what is right for learners	Adaptation of teaching based on the learners' needs

Knowledge of classroom management	The ability to engage and motivate learners		The ability to encourage collaboration	The ability to handle discipline problems
Visual-impact knowledge	Knowledge of the impact of the teachers' appearance on learners		Knowledge of the impact of the teachers' facial expressions on learners	
Knowledge of self	Knowledge of teachers' own characteristics	Reflective thinking (knowledge of teachers' own behavior)		
Curriculum knowledge	Knowledge of apt content	Knowledge of apt course design/learning environment	Knowledge of apt assessment	Knowledge of apt learning materials/technology
Language subject knowledge	Knowledge of language (language proficiency)		Knowledge about language (knowledge of what part of language to teach)	
Contextual knowledge	Knowledge of home 1. knowing learners' parents and home conditions 2. Relationship with parents 3. Knowing what parents think/expect	Knowledge of society (what the society thinks)	Knowledge of school 1. Knowing the significance of the relationship with colleagues. 2. Knowing what the colleagues think/do/expect	

Contents of Each Knowledge Type

Knowledge of Learners' Characteristics

Knowledge of learners' characteristics can be one of the most important kinds of knowledge for any teacher PKB framework (Chaharbashloo, et al., 2020; Akabari & Dadvand, 2014; Nougaret et al., 2005; Stough et al., 1998). This is because to teach well, we need to know our learners well. In the context of teaching English to children with special needs, it has an added significance; interestingly, knowledge of learners' characteristics (and its three sub-components) was identified and accentuated repeatedly by all the three teachers as the foundation of their teaching profession.

Confirmed by previous research and based on the three teachers' comments, *Knowledge of Learners' Cognitive Characteristics* allows the teachers to understand that most IDS have poor and limited short-term memories (e.g. Chapman & Hesketh, 2000; Stough et al., 1998), which substantially affects their learning generally, and it especially affects learning a foreign language such as English. For example, the first teacher in her first interview explained that "these kids forget things quickly because of a weak short-term memory. I know they have poor short-term memory, even in math" (First teacher, Interview).

Comparable with Stough et al.'s (1998) Students' Characteristics category, *Knowledge of learners' psychological/emotional/behavioural characteristics* is another sub-component of knowledge of learners' characteristics (see also Chaharbashloo, et al., 2020) by means of which teachers can create an atmosphere that would increase the motivation of IDS. Teacher three explicated such knowledge asserting that "These children are very intimate, but they also have a sense of competition, not a negative kind of competition … It is very important for these children to be approved by their teachers and their families" (Third teacher, Interview).

The participants' comments contributed to the conceptualization of the third sub-component, namely, *Physical/Developmental Characteristics*. For example, in line with the above-mentioned literature (see e.g. Buckley, 2002; Chapman & Hesketh, 2000; Tager-Flusberg et al. 1990), one teacher emphasized that "in childhood, they are slow in learning and forget everything quickly. In adulthood, it is almost the same, but as they get older, their learning process improves too" (Third teacher, Interview). Another teacher also emphasized that "These children go through a slower learning process than ordinary children, whether in Farsi or in English…" (Second teacher, Interview).

(Learner-based) Pedagogical Knowledge

Pedagogical knowledge is defined by Shulman (1987) as "those broad principles and strategies of classroom management and organization that appear to transcend subject matter" (p. 8). Our participants revealed a more learner-oriented (rather than content-based) pedagogical knowledge (compare with primary school teachers of Chaharbashloo, et al., 2020) with three sub-components: 1) *familiarity with teaching methods*, 2) *an intuitive understanding of what is right for learners*, and 3) *adaptation of teaching based on learners' needs*.

In Iran, most EFL special-education teachers have majored in English language teaching themselves, hence their *familiarity with various teaching methods; plus* realizing IDS have poor short-term memory (Abbeduto et al., 2005), they tend to adopt and adapt teaching

methods that could better cater for their memory constraints. For instance, elaborating on the alternative methods she could have used, one of the practitioners complained that "teachers at language centers use specific methods of teaching, but we cannot adopt these methods with these students" (First teacher, Interview). The significance of this sub-category is commonly recognized by almost all the PKB frameworks whether pertaining to general education, special education, or language pedagogy (e.g. Akbari et al., 2012; Akbari & Dadvand, 2014; Chaharbashloo, et al., 2020; Grossman, 1990; Moradkhani, 2017; Nougaret et al., 2005; Stough et al., 1998 among others).

The second sub-component of learner-based pedagogical knowledge is an *intuitive understanding of what is right for learners*. The first teacher explained that "we look at our learners' mood and conditions and the atmosphere of the class every day, and then prepare to teach [what we feel is right] accordingly." The first and second teachers also believed that their reluctance to (explicitly) teach grammar to IDS (even if not supported by research) is out of their experience of teaching as well as their own intuitive understandings of their learners' needs and wants. Although the second sub-component might appear to be a little fuzzy, the teachers seem to give more credit to their intuitive pedagogical decisions as to the artistic aspect of their profession rather than their content-oriented lesson plans.

The third sub-component of learner-based pedagogical knowledge is an *adaptation of teaching based on the learners' needs*. The second teacher, for instance, emphasized conducting an ongoing informal need (necessity) analysis, "Look, I already have a plan, but ... the conditions dictate me to change the way I teach. … compared to normal children, these kids need more repetition in learning …" (Second teacher, Interview and Observation).

In general, both the second and third subcomponents of learner-based pedagogical knowledge appear to be more exclusive to special education teachers' knowledge of the practice. In fact, the introduction of some (sub)categories like Instructional Strategy of modification as well as Instructional Diagnosis in Stough et al.'s (1998) framework accentuates the relevance of the significance of this component of special education teachers' cognition.

Knowledge of Classroom Management

Knowledge of classroom management, in this study, similar to several other studies (e.g. Akbari et al., 2012; Akbari & Dadvand, 2014; Chaharbashloo, et al., 2020; Nougaret et al., 2005; Stough et al., 1998; Yazdanmehr et al., 2020 among others), has been conceptualized as an integral component of teachers' knowledge of the practice. It was revealed to have three

main sub-components, namely, *the ability to engage and motivate learners*, *the ability to encourage collaboration*, and *the ability to handle discipline problems*.

Firstly, as another step toward learner-centeredness (see Chaharbashloo, et al., 2020), many of the teachers' decisions, including manipulating the classroom environment and the type of teaching method used to teach IDS, were made carefully in order to *engage their learners in learning and to further motivate them*. For example, the second teacher in one of her interviews explained that "…when I saw my students liked to learn colours, I changed the program and taught them the colours" (Second teacher, Interview and Observation).

Secondly, according to the three teachers (as well as some parents of IDS who were informally interviewed), due to the marginalization of these children in the society and unfortunate attitudes and behaviours toward IDS, these individuals may be deprived of enough social experience, and this can make English classes more important to them. To create a positive social experience for these learners, the teachers emphasized, we need to *encourage collaboration between/among them*. It appears to be among those sub-components of IDS EFL teachers' cognition which is less highlighted as an integral, separate knowledge sub-category in general and EFL PKB categorizations.

The last sub-component of knowledge of classroom management is *the ability to handle discipline problems*. According to the three teachers in this study, IDS (particularly teenagers) do not observe, at times, their behaviour in classrooms or in the society. Depending on their familiarity with each particular student, the teachers frequently resorted to different methods and strategies, ranging from ignoring the behaviour to direct verbal warning to exclusion from class activity, to solve problematic behaviours, without hurting the children's emotions:

When … misbehave in class, the last thing I can do is telling them that I will speak with their mom or dad, because for these children parental approval is very important (Third teacher, Interview).

If students do not do their homework, they will not be allowed to attend the class… this can be the most severe punishment for them (Second teacher, Interview and Observation).

While some of these techniques might be questionable, the teachers stated they needed to prevent and stop severe problem behaviours as soon as possible due to the tendency among their special students to imitate each other's behaviour or getting easily hurt (physically,

academically, or emotionally) by the troubling behaviour. In general, in spite of the naming similarity with general and EFL education frameworks, the content of this sub-component is more similar to other special education frameworks in terms of the techniques, concerns, and strategies (e.g. compare with Chaharbashloo, et al., 2020; Nougaret et al., 2005; Stough et al., 1998).

Visual-impact Knowledge

We were convinced to incorporate *visual impact knowledge* as a separate category in our proposed framework because of its prominence for all our teachers. *Knowledge of visual impact* has been defined in this study as an understanding of the effect of the appearance of teachers as well as their facial expressions on their language learners' learning.

All teachers believed that *teachers' appearance* can play a vital role in motivating IDS. One of the teachers maintained that "these children love freshness, smiles, and fun. I mean you should have a new look every session. One of the best teacher characteristics that these children love is when the teacher uses bright colours in his/her clothing". This can show the teacher is good at understanding learners' emotions. Importantly, it can also show that the teacher is aware of the extent her clothing and appearance influence her learners' motivation, happiness, and freshness in a community where, until recently, wearing too shiny, colourful clothes, or make-up could disqualify you as a teacher.

Teachers' facial expressions sub-component underscores IDS' good visual memory (e.g. Abbeduto et al., 2005; Chapman & Hesketh, 2000; DSE, n.d). In this light, the first teacher clarified that "because the children have a strong visual memory, I felt that they can learn better by looking at my mouth, and so I exaggerated the pronunciation of words with noticeable lip and mouth movement".

Knowledge of Self

Knowledge of self in this study has taken its name as well as the names of its sub-components from Chaharbashloo, et al.'s (2020, p. 12) framework. In this study, knowledge of self refers to *teachers' understanding of their own characteristics* that can positively or negatively influence their learners' learning. Knowledge of self also includes *teachers' own reflective thinking* in the sense of thinking about what they do in class and how they treat their learners. The description of one of the teachers in her interview clearly showed that a good teacher for IDS should have a good understanding of not only the characteristics of a good special-education teacher but also her own characteristics. In particular, being asked about the

characteristics that made her a suitable IDS EFL teacher, she generally pointed to the following features absence of which would disqualify her for this job:

> A good teacher for children with Down syndrome should be very patient … The teacher should have nice and colourful clothing as well as a neat appearance. He or she should be well-versed and up-to-date in the knowledge of teaching, but should also be creative enough to have his/her own teaching plan and adaptation based on her learners' needs. The most important point is that the teacher should know the characteristics of his/her learners well (Third teacher, Interview).

By *reflective thinking* in this study, it is meant teachers' awareness and understanding of what they do in class and how they treat their learners as well as an understanding of whether what they do is useful for their learners (comparable but not identical to Stough et al.'s (1998) Monitoring Behavior and Academics as well as Instructional Diagnosis). Being asked about her frequent recourse to Farsi in class, one of the teachers recalled that: "I used to try to speak English all the time during teaching. [Upon reflection] I felt that my talk was not comprehensible for my students. I could see that my students did not understand and did not pay attention to me. So, I chose using their mother tongue" (First teacher, Interview). Most probably incentivized by their special circumstances and lack of adequate pre-service and in-service professional support, Iranian IDS teachers of English showed an evident preoccupation with reflection before, during, and after teaching in numerous instances during our observation, interview, and stimulated recall sessions (while many such instances are associated with other knowledge categories).

Curriculum Knowledge

Being presented with no special curriculum and/or specialized materials for foreign language (mainly English) learning in the context of special education was highlighted by all the three teachers as one of the major gaps and challenges of special education in Iran. Therefore, special education English teachers have to design their own syllabus based on the needs of their students and also by adopting and adapting the textbooks that are designed for normal children.

Consequently, they need to *know the appropriate content for their classes* (hence the first subcategory of curriculum knowledge). For example, in relation to *knowledge of apt content*, one of the teachers stated that "The teaching time and the content of teaching for these children should be short and limited, but the quality of teaching should be high and rich" (Third teacher,

Interview). Specifically talking about the components of curriculum and course content and the principles governing their selection (as elucidated in the pertinent literature like Macalister & Nation, 2020), one of the teachers justified her choice of content: "I have taught all the sounds except some diphthongs because I know that my students get confused if they are taught these sounds" (First teacher, Interview).

Furthermore, a major, pertinent sub-component of their PKB was the *Knowledge of apt learning materials/ technology*. In this regard, the second teacher mentioned that "I do not use this book very much; I copy most of the texts from it to present at each session. Since not all children have books (because of their parents' financial problems), I only choose the parts that I want to teach, and instead focus more on flashcards" (Second teacher, Interview and Observation). In line with their *Knowledge of learner-based pedagogy*, the third teacher emphasized that using flashcards, as an educational technology "is one of the best techniques in teaching children with Down Syndrome; with flashcards you can have access to the visual memory of your students and you can help them to visualize" (Third teacher, Interview).

Moreover, regarding the third sub-component of curriculum knowledge, the three teachers, directly and indirectly, mentioned the importance of an *appropriate learning environment* for IDS. For example, the first teacher indirectly stated in one of the interviews that "the atmosphere and classroom space are not suitable for these children to learn English. I should stick the alphabet and the numbers on the walls and have posters in an educational environment…" (First teacher, Interview). This knowledge is elaborated on in Chaharbashloo, et al. (2020) under the Knowledge of Desirable Learning Environment as well as in Stough et al. (1998) under Classroom Management (see also Akbari et al., 2012; Moradkhani, 2017).

The last sub-component of *Curriculum knowledge*, namely, *Knowledge of apt assessment* allows teachers to obtain useful information about their work, educational process, and students' learning problems and progress. Being familiar with assessment methods, our participants were not in favour of formal assessment and preferred alternative informal modes (see also Chaharbashloo, et al., 2020; Shulman, 1987). Actually, being concerned with their pressure on students, one of the teachers opposed formal means of assessment by asserting "I do not believe in any forms of [formal] assessment for these children. However, I use dictation in almost every session as a technique to reinforce my learners' writing ability and monitor their progress" (First teacher, Interview and Observation). In general, the ongoing (informal) monitoring and assessment module appear to be an indispensable, major sub-component of the

knowledge base of special education teachers (compare with Nougaret et al., 2005; Stough et al., 1998).

Language Subject Knowledge

Language subject knowledge, with two sub-components, refers to the knowledge of the language under teaching (also reiterated in the frameworks by Akbari & Dadvand, 2014; Akbari et al., 2012; Moradkhani, 2017). In the context of special education, more important than *Knowledge of language,* which refers to the language proficiency of the teachers themselves, is *knowledge about language*, which refers to an understanding of what part of a language is necessary to teach and focus on, determined based on language learners' needs. Even though we can take teachers' language proficiency for granted when they want to teach elementary levels, the *knowledge about language* needs special attention; the teachers stated they should be very selective when deciding 'what,' 'when,' and 'how' to teach. For instance, highlighting her knowledge of and a concern with the skills and components of the language to be taught and focused on, the first teacher contended that "right now, I cannot work very much on reading skills, because these children are still in alphabet level, and I can only work a little on their basic level of speaking".

Contextual Knowledge

Being shared between general and special education models (Chaharbashloo, et al., 2020; Nougaret et al., 2005; Stough et al., 1998), *contextual knowledge* which is conceptualized in terms of three subcomponents is highly crucial for IDS teachers of English and their classroom decisions.

Knowledge of home enables our teachers to appreciate the significance of their relationship with parents and know what learners' parents think, do, and expect. Generally, the teachers' good relationships with the families, who typically have the strongest bonds with IDS, can help teachers a lot. All teachers participating in this study considered teachers' relationships with parents to be essential in educating and teaching IDS. Knowing about the problems of families (including their financial situation) leads the teachers to more flexibility in their teaching materials and strategies (see 4.2.6. above, the example for *Knowledge of apt learning materials/technology*).

Knowledge of society refers to what the society and people, in general, think about IDS. Highlighting the talents and potentials of their learners, the language teachers complained that the "misconduct of the society" can seriously stifle the self-confidence, learning power, and

exquisite talents of IDS. For instance, one of the teachers regretted that "there are many talented children with Down syndrome who have been isolated. Because of the misconduct of the society, these children have not been able to show and flourish their abilities like everybody else".

Finally, our teachers' k*nowledge of school* revealed the significance of their relationship with their colleagues, and knowing what their colleagues think, do, and expect in order to utilize this knowledge for their students' benefit (compare with Chaharbashloo, et al., 2020; Nougaret et al., 2005).

Conclusions and Implications for ELT Special-Education

Motivated by insufficient studies of EFL special-education teachers and the content of their PKB, we observed and videotaped three IDS practitioners' classes and interviewed them using the stimulated recall technique. It resulted in an emerging, data-driven framework (with 8 components and the related sub-components) proposed for IDS language teachers. Apart from (inherently nominal) overlaps with the previous frameworks offered for general and special (non-language) education as well as ELT, our framework can be claimed to be essentially different owing to the peculiar context of teaching and the stakeholders involved. For instance, from among the eight components and sub-components of the model, *curriculum knowledge* and *knowledge of language* were generally underestimated by the teachers as long as they pertained to a content-oriented approach (Chaharbashloo, et al., 2020). Alternatively, an overemphasis on the learners, their characteristics, and their needs resulted in the inclusion or redefinition of learner-oriented components and/or sub-components like *knowledge of learners' physical/developmental characteristics*, *intuitive understanding of what is right for learners*, a *knowledge of the impact of the teacher's appearance on learners*, *knowledge of the impact of the teacher's facial expressions on learners*, and *contextual knowledge*.

Apparently, sharing vested interests in the education enterprise of IDS, the three participating teachers who had been in close contact with IDS (as mothers, relatives, and/or teachers) would prioritize the learners' needs and well-being over completing a predetermined syllabus. Of course, this learner-oriented approach was informed and/or justified by their deep understanding of their learners' (physical, social, and cognitive) limitations and potentials, their likes and dislikes, the contextual (familial, social, and school) variables, their developmental path and pace, coupled with the teachers' flexibility, creativity as well as pedagogical, curricular, and linguistic knowledge bases (see also McFadden, 2014).

While we invite caution making generalizations based on our rather limited data-set, our observations and interviews were in line with mounting evidence suggesting that the IDS can become bilinguals with no apparent detrimental effect on their first language or cognitive development (not to mention some anecdotal cases of successful bilinguals taking on social roles and decent jobs) (Buckley, 2002; Burgoyne et al., 2016). Education of IDS (exclusively or through their integration in regular education), though, proved to be difficult in many countries and contexts (including Iran) (Javadnia & Tahzibi, 2012). It might be, partly, due to the teachers' lack of preparation and experience in teaching IDS, their unawareness about these students' needs, characteristics, and developmental patterns, among others (c.f. Johnson 2006; Laws et al., 2000).

Inspired by the findings from the investigated EFL context, we would like to invite all parties involved in special education enterprise (in similar contexts) to take meaningful measures to substantially enhance the practicing and prospective teachers' content of PKB. It is also essential to increase their familiarity with the latest findings (see literature review above) on the characteristics and developmental pace and path of their learners as well as an array of classroom management techniques alongside materials development abilities to ensure a safe, colourful, engaging, and motivating social environment.

Through illuminating the content of teachers' knowledge of teaching, studies like ours (preferably within different contexts and/or adopting other methodologies) can be a first step in narrowing the above-mentioned gaps and even enhancing the wisdom of practice (Chappell, 2017) among (prospective) ELT special education teachers (and their supervisors or educators), who wish to interrogate and improve their knowledge of the practice. Particularly, they can offer a point of departure in teacher preparation, teacher selection, and teacher (re)adjustment (e.g. language teachers who want to specialize in educating learners with special needs) programs (see also Akbari & Dadvand, 2014; Moradkhani, 2017).

It is hoped that our study could draw attention to this hugely overlooked group of language learners and their right for access to qualified teachers (and learning materials). The insights offered by such studies are of use for policymakers, school managers, materials and course developers, teacher educators, and practitioners in order to eventually boost quality education with its impact on the well-being of all the stakeholders involved in special education ecology (Nougaret et al., 2005; Mercer, 2021).

Declaration of Conflicting Interests

The authors of this study declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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