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Funds of knowledge in 21st century societies: inclusive educational practices for under-represented students. A literature review

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ABSTRACT
Although the first educational applications of the *funds of knowledge* (FoK) concept were carried out in the late 1980s, there have been numerous developments and proposals since then, many of which have been made within the last few years. It continues to be, therefore, a valid, cutting-edge educational approach; one which seeks to overcome the lingering deficit perspective in education, by improving relationships between families and schools, and by designing culturally sensitive and contextualized curricular activities. In this review, we have identified 92 peer-reviewed publications relating to FoK in the ERIC database, dating from between 2011 and 2015. In this review, we aim to provide a summary of this literature and identify potential key trends, tensions, extensions and issues concerning current applications of the FoK approach. A number of contributions for teacher candidates and teacher professional development derived from the literature review are also suggested.

KEYWORDS
Funds of knowledge; teaching methods; teacher education; culturally relevant education

Introduction

The approach known as *funds of knowledge* (or FoK) originated in Tucson, Arizona, in the early 1980s. The project was aimed at countering what was described as *deficit thinking* in education; i.e. the idea that low school performance among underrepresented students was caused by underlying linguistic, economic and cultural limitations (González, Moll, & Amanti, 2005; Valencia, 2010).

The original authors of this approach, known as the 'Tucson academics' (Hogg, 2011, p. 669), put forward their ideas with the purpose of contributing to the educational reform of public schools that serve US–Mexican populations in the Southwestern United States (González et al., 2005; Vélez-Ibáñez & Greenberg, 1992).

This region has very strict immigration policies to the extent that, in 2000, a ban on bilingual education was approved in order to dismantle this form of instruction (Moll, 2005). More recently, in 2010, the State of Arizona Law SB 1070 was passed, according to which, undocumented immigrants are regarded as criminals; indeed, all those who by their appearance may be suspected immigrants, regardless of whether they are US citizens or legal or

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illegal immigrants, can be considered as suspected perpetrators of crimes. With this legal and political protection, police can detain a person when they have 'reasonable suspicion' that he or she is undocumented in cities such as Tucson where about half of the population is of Hispanic or Latino origin.

In setting out the context of the FoK approach, Moll (2005) concludes that: 'it is impossible to ignore, then, that schooling practices are related to issues of power and racism in US society, especially as related to the working-class status of these families (…) It is in the context of this recognition that schooling practices are always intricately related to broader issues of social class, ideology, and power, that we must situate our study and understanding of funds of knowledge' (p. 276).

Hence, in order to challenge the deficit thinking prevalent in education and the racist policies that misunderstand the inherent complexities of migrant people, it was argued that the households of students of Mexican origin living in Tucson did, in fact, have at their disposal a wide variety of skills, knowledge and competencies forged in their working lives and community history (Moll, Amanti, Neff, & González, 1992). However, these intellectual and educational resources were essentially invisible in school practice and curricular structure due to asymmetric power relationships (Rodriguez, 2013). Therefore, school performance could be improved by having teachers visit the families of some of their students, identify their skills and knowledge and incorporate them into educational practice.

The idea involves an educational policy and concept which, by recognizing and legitimizing the lifestyles involved in the cultural practices of the students' families, is expected to create relationships of 'confianza' (mutual trust) between teachers and families in order to: (a) build bridges of cooperation that can diminish the prejudices and stereotypes between the two contexts of activity (Gonzalez & Moll, 2002) and (b) link school curricula and educational practice to the lifestyles of students (McIntyre, Rosebery, & González, 2001).

According to Moll (2014), the FoK approach includes three related elements: (1) *Research in households* – ethnographic visits – in which teachers, in collaboration with colleagues, visit some student's families at home for the purpose of uncover the cultural family resources or *FoK* and establish relations of trust between teachers and families; (2) *Classroom analysis*, or study of the new classroom practices developed by the teachers; and (3) *study group meetings* for discussion theory (*FoK* approach, ethnographic literature), methods and data collection, and findings in relation to the study of the households and classrooms (González et al., 2005). The study group is developed by teachers and researchers and it becomes a 'mediating structure' (Moll, 2014, p. 123) that connects the household analysis and classroom activities. It is in the study group that it begins preparing for the household visits and explore how household data can become resources for teaching.

A few years ago, in a review of the literature on the subject, Hogg (2011) proposed a clarification of the meaning of the FoK concept and identified a number of FoK developments and the extent of its application in the field of education. Specifically, what we propose to do here is to continue in this line by reviewing the literature between 2011 and 2015.

There are three objectives in this review. First, we shall describe the literature with regard to content, curricular subject, educational level and the countries in which these educational experiences were carried out. Second, with this information, we shall discuss some of the tensions, extensions, issues or developments of the approach. Finally, we also hope to be able to identify significant issues involved in improving teacher training for both trainee and professional teachers.

This article is divided into three main sections. First, we describe the original context and the original content of the educational uses of the FoK approach. Secondly, we explain the bibliographic analysis carried out, along with the conclusions reached from the aforementioned categories of analysis (first and second objectives of the review). Finally, in the discussion section, we link the existing literature we have reviewed with teacher candidates and teacher professional development (i.e. the third objective of the review).

The origin and early stages of the *FoK* approach

The *FoK* concept originated with the seminal works by Vélez-Ibáñez (1983) on US Mexican households and their social and economic systems of interchange. Vélez-Ibáñez, together with Greenberg, were the first to propose the notion of FoK, in the context of the study into the forms and strategies that allowed immigrant families to survive and further their personal development in the USA. They understood the term to mean the 'specific strategic bodies of essential information that households need to maintain their well-being'. (Vélez-Ibáñez & Greenberg, 1992, p. 314). However, the definition of FoK most widely used in the literature (Hogg, 2011) is the one provided by Moll et al. (1992): 'These historically-accumulated and culturally-developed bodies of knowledge and skills essential for household or individual functioning and well-being' (p. 133).

The first study to explore the educational potential of the *FoK* approach was the 'Community Literacy Project', initiated in 1988 (González, 1995). The main goal of this project was to help teachers to design new forms of education based on the literacy practices and FoK of the documented households.

After this experience, a pilot FoK study was initiated in 1990–1991, with 10 teachers from 3 schools (González, 1995). The premise and the findings of the 'Funds of Knowledge for Teaching Project' was the same as in the 'Community Literacy Project' and in all the sister projects, such as the subsequent project BRIDGE (González, Andrade, Civil, & Moll, 2001), namely, that the educational process can be greatly enhanced when teachers learn about their students' households and their everyday lives (González, 1995).

In other words, low-income Latino families and communities have linguistic and cultural resources that can be employed to support children's learning in school. Teachers can strategically connect the curriculum to these rich, culturally based, out-of-school activities ranging from tasks involved in gardening and house construction to the commercial transactions taking place at 'swap meets' (González et al., 2005; McIntyre, Rosebery et al., 2001). For example, McIntyre, Swazy and Greer, (2001) described how two teachers made visits to the homes of their students in rural Kentucky to better understand their particular FoK. As a result of these visits, the two teachers designed a series of reading, writing and mathematics lessons around a major annual school event: the 'Agricultural Field Day'. They connected the curriculum to students' lives by uncovering the students' and families' extensive knowledge and abilities of farming (e.g. growth rates of various plants). In this example, the teachers used three strategies to contextualize the curriculum. First, the teachers designed instructional activities based on what students already knew from home, community and school (e.g. using books on agriculture that were very popular with the students). Second, these teachers assisted students in connecting and applying their knowledge to classroom activities (e.g. relating the knowledge on how their families cultivated plants to the life cycle of plants and, subsequently, to the life cycle of animals). Third, these teachers provided opportunities for

parents and community members to participate in classroom instructional activities (some parents volunteered to help with the agricultural field day).

It is important to note here that *culture* is understood to refer to socio-cultural practices, what people do (and the experiences associated with these practices), how people perceive what they do. Consequently, rather than assuming a static, homogeneous conception of *culture* (Japanese culture, corporate culture, and so on), it is assumed the hybridity nature of culture (González, 1995). In other words, the focus is not in shared culture rather families' practices and lives experiences. It is a processual approach that focus on the process of everyday life, in the form of daily activities, as a frame of reference. These daily activities are a manifestation of particular historically accumulated FoK that households possess. Instead of representations of an essentialized group (Islamic culture, Mexican culture), household practices are viewed as dynamic, emergent and interactional (González et al., 2005). Hence, the need to carry out an ethnographic analysis, i.e. to visit the homes of families in order to document their practices and life contexts through which each family's particular abilities, skills and knowledge emerge (González, 1995).

In addition, visiting the homes of the students meant breaking with the traditional balance of power in which the teacher, as the expert, informs the parents about their children's performance. Now, in contrast, families were thought of as intellectual resources, as competent people, whatever their social, linguistic, religious, economic or cultural diversity may be (Rodriguez, 2013).

The objective of the FoK approach is threefold: first, to improve the academic performance of those students considered underrepresented due to low income, racial/ethnic minority status, foreign origin, low fluency in English or being first-generation college students (Rios-Aguilar, Kiyama, Gravitt, & Moll, 2011); second, to improve relations between teachers and families by creating ties of 'confianza' (mutual trust) and third, to carry out curricular and instructional innovations by incorporating their FoK and their articulation within the curriculum and school practice.

From a socio-cultural perspective, the study groups formed by teachers and researchers are considered to be contexts of activity that are able to mediate the process whereby teachers *theorize* the households through home visits and then design school programmes accordingly (Moll, 2014). In this respect, teacher professional development is conceived as the result of participation in a community of practice – the study-groups – through which participants appropriate the terminology of the FoK, acquire the tools of methodological analysis (ethnography) and are given support in designing educational and curricular activity (Jovés, Siqués, & Esteban-Guitart, 2015).

The remaining sections of the paper proceed with such an analysis of the literature revision carried out to deepen our understanding of the current state of the FoK framework and in particular as contributions to teacher candidates and teacher professional development.

Description and critical analysis of the *FoK* literature 2011–2015

To conduct this review of the literature, searches were made using the *Educational Resources Information Centre* (ERIC) of the Institute of Educational Science, with the search term 'Funds of knowledge'. Since two comprehensive reviews of the literature have already covered the period before 2011 (Hogg, 2011; from 1988 to 2011 and Rodriguez, 2013, from 1992 to 2011),

it was decided to limit the search to the last five years. That is to say, our search, which was carried out on 12 October 2015 covered the period from 2011 to 2015.

Our first step was to codify the papers and articles according to their purpose and content, i.e. whether they focused mainly on: (1) discussing the term theoretically (*theoretical research-informed papers*), and (2) to document empirically how this approach has been used in educational interventions (*educational research-based papers*).

For those FoK-related articles coded as educational research-based papers, we took note of the curricular content (mathematics, science, language, technology, geography, etc.), the level of education to which the educational experiences were addressed and the context (i.e. the country) in which they took place.

The questions that guide this review are derived from the three objectives we mentioned earlier. First, in describing the literature, we aim to get an overview of the contexts, the education levels and curriculum areas of the educational experiences identified. These aspects also appear in the review by Hogg (2011), and we will therefore be able to compare our findings with Hogg's in the discussion. Secondly, we want to provide a critical analysis of the literature, in order to identify some of the innovations and limitations of these educational experiences, as well as the key issues emerging in contemporary applications of the FoK approach. Finally, we want to link the literature to teacher candidates and teacher professional development, something we hope to cover mainly in the discussion.

The 92 peer-reviewed articles identified as being related to the FoK approach were divided into two categories mentioned above: the majority, 74 in total, illustrated various educational applications (educational research-based papers) while the remaining 18 were concerned mainly with theoretical questions (theoretical research-informed papers). Consequently, we divided this section into two subsections to deal with these two categories. For each category, a description will be given along with examples of articles.

Description of educational applications and some noteworthy innovative contributions in the educational interventions carried out

The curricular subject most touched upon by the articles we reviewed was *literacy*, with 20 articles, followed by *second language acquisition* (generally English) and aspects related to multilingualism (14). Other areas included in the articles are mathematics (10), science (9), social studies and social justice (6) technology (2), sustainability (1), geography (1) and health (1). There are other works that focus on more cross-cutting issues such as evaluation (3), identity (2), developmental disabilities (2) and family ideologies (2) and transition to college among Latin American students (1).

The focus of the articles is fairly evenly spread across the educational levels with elementary education being most popular (with a total of 21 articles), followed closely by elementary secondary education (18), higher education, postsecondary education and adult education (18) and early childhood education or preschool education (17).

Finally, in relation to the countries in which these educational interventions based on FoK approach took place, the USA stands out with 43 articles, followed by Canada and England (7 each), Australia and New Zealand (5 each), Pacific Islands and Uganda (Africa) (2 each) and The Republic of the Philippines, Tanzania, Chile and Mexico (with 1 each). This gives a total of 75 references since one of the studies (Licona, 2013) was carried out in two countries, the US and Mexico.

Taken together, the focus of the articles range from illustrating educational work in specific curricular subjects (e.g. Ewing, 2012 who describes the educational use of FoK that incorporates the mathematical knowledge used by Torres Strait families in Australia in their traditional practices of sorting shells and giving fish) to teacher training (e.g. the study by Cremin, Mottram, Collins, Powell, & Drury, 2012 in which 18 teachers from 10 primary schools in 5 local authorities in England document the literacy lives of their students).

There are some noteworthy innovative contributions of this applied research that look at aspects that have not been covered previously by the Tucson academics (González et al., 2005) and have not been identified in the literature revision carried out by Hogg (2011), three of which we highlight below.

Firstly, while the original work involving FoK is almost exclusively concerned with the detection of parents' FoK for applications among school populations, we have found studies involving adult education (Larrotta & Serrano, 2012; Mosley & Zoch, 2012), children with developmental disabilities (Riojas-Cortez, 2011; Stone-MacDonald, 2012) and the detection of FoK of grandparents. In that regard, Ruby (2012) analyzed the strategies and skills used by Bangla-speaking grandmothers in order to preserve their linguistic and cultural identity in their grandchildren.

Secondly, at the curriculum level, other subjects that had previously been scarcely mentioned in the FoK literature revised by Hogg (2011) make an appearance, such as geography (Hinde, 2012), health (Zanoni, Rucinski, Flores, et al., 2011) or sustainability (Ward, 2013). In the case of geography, for instance, Hinde (2012) advocates using the FoK that children have in relation to geography (the world around them), providing examples of this in classes designed by K-2 and K-3teachers. For example, in one of these, called *As the Kids Come and Go*, designed by Kathy Knowler for K-2, the class becomes a zoo and the children have to learn to create maps and write about them. The children work in groups of three and create mini-maps of the class which then become little books that can be read and used to orient themselves in space based on directions given by their classmates. These studies are good examples of how to open up ways to areas of the curriculum other than language, science and mathematics, which provide the focus of most of the FoK-based educational experiences.

A third important contribution to the Tucson academics literature (González et al., 2005) is the proposal to use material produced by the students themselves in order to detect their FoK and simultaneously link this material to the curriculum content and school activities. For example, *picture books* have been used to make connections between personal experiences, the school curriculum and the values and beliefs of families with students aged 9 and 10, using the picture book, *Mirror*, by Jeannie Baker. In this experience, the students, sometimes with the participation of their families, created illustrations and drawings, and compared their own situations and personal experiences with the contents and themes that appear in the book (Mantei & Kervin, 2014).

What theoretical questions have emerged regarding the FoK approach between 2011 and 2015?

The 18 articles in our review of the literature whose approach was more theoretical or conceptual in nature (theoretical research-informed papers) can be divided into three groups. Table 1 shows the specific topics (or concepts) associated with the articles in these groups.

Table 1. Thematic core of FoK-related articles with a theoretical-conceptual approach.

Critical issues	Specific topics and associated articles
Justice and social change	Epistemic justice (Gonzales, 2015); pedagogies of transformation (Wrigley et al., 2012); raising aspirations (McInerney & Smyth, 2014; Zipin et al., 2015); transforming expectations (Templeton, 2013); power and agency (Rodriguez, 2013)
Dialogue with other theoretical approaches	A Capital Approach (Hinton, 2015; Rios-Aguilar et al., 2011; Zipin, Sellar, & Hattam, 2012); third Space/ hybridity and practice theories (Carlone & Johnson, 2012); third space and figured world (Seiler, 2013); participatory learning theories (Hedges & Cullen, 2012); family literacy ecology of communities framework (Chao & Mantero, 2014)
Developments and particularities of the funds of knowledge notion	Funds of knowledge (literature review on the concept) (Hogg, 2011); funds of (difficult) knowledge (Becker, 2014); children's funds of knowledge based interests (Hedges et al., 2011); popular culture as funds of knowledge (Hedges, 2011; Petrone, 2013); teachers' funds of knowledge (Hedges, 2012)

Group 1. Justice and social change

In line with the initial spirit of the FoK approach, a number of authors underline its transformative nature; it is described as a 'pedagogy of transformation' (Wrigley, Lingard, & Thomson, 2012) that can be used to modify prejudices, stereotypes and expectations (Templeton, 2013); it can be used to recognize and legitimize different ways of knowing, interpreting and involving oneself with the world (Gonzales, 2015) and it can help to raise aspirations (McInerney & Smyth, 2014; Zipin, Sellar, Brennan, & Gale, 2015).

However, unlike early studies which focused on transforming the power relationships between teachers and families as well as transforming educational practices to make them more culturally congruent (Rodriguez, 2013), recent studies have incorporated the need to take account of difficulties arising from the conditions of individual families that may help teachers to understand, for example, that a student may be falling asleep in class because he has been caring for a younger sibling until late at night. In many FoK studies, researchers have limited themselves to creating a list of knowledge, skills and abilities susceptible to being incorporated into curriculum practice. However, others have strongly recommended getting to know the everyday living conditions of students in order to better understand their behaviour as well as the situation of their families, thus converting simple prejudices into judgments based on empirical knowledge (Templeton, 2013).

Another new notion is to consider FoK as a tool for 'raising aspirations'; 'emergent senses of future potential, grounded in lived cultures, which hold possibility for imagining and pursuing alternative futures' (Zipin et al., 2015, p 227). In this case, the students, along with teachers, co-construct the curriculum and document their own lives, as well as the problems around them, with the aim of promoting opportunities and positive expectations about the future. In this way, students are actively incorporated into the process and recognized as capable of documenting the FoK of their families and communities. This broadens the traditional approach in which responsibility for detecting funds knowledge rested solely on the teacher. However, meeting this aim and 'raising aspirations' requires institutional support and policies that can address the systemic causes of injustice and educational and socio-economic inequalities (McInerney & Smyth, 2014). This would bring about social transformation

at two levels: at the micro-levels of school communities and at the macro-levels of society and power structures (Rodriguez, 2013). It is our view, however, that while the FoK approach has provided powerful strategies for transforming the relationships between students, families and teachers, it can hardly lead to a transformation of society as a whole without political action at a much more macro level.

Group 2. Dialogue with other theoretical approaches

The main focus of the articles in this group is to create discussion and dialogue between the FoK approach and other approaches and theories. This is the case of the 'Community Cultural Wealth' model described by Tara J. Yosso (2005), which supports the idea that underrepresented students hold various forms of cultural 'capital'. Such capital is variously described as *aspirational* (dreams and aspirations), *social*, *linguistic*, *familial*, *navigational* (skills in navigating different social institutions) and *resistance* (the experiences of '*communities of color*', for example, in the struggle for equal rights and collective freedom). Various authors have established relationships between the FoK approach and Yosso's model (Hinton, 2015; Rios-Aguilar et al., 2011; Rodriguez, 2013; Zipin et al., 2015). As we will reiterate and emphasize in the discussion, we believe that the dialogue between the two approaches enriches the notion of FoK by taking into account skills related to resistance, future aspirations and the transition between different social institutions (i.e. resistance, aspirational and navigational capital) – aspects that have not been incorporated into the traditional notion of FoK which is limited to what in Yosso's terminology, would be described as social, linguistic and familial capital (Yosso, 2005). In this sense, we do not agree with the criticism made by Hinton (2015) who considers that the metaphor of 'capital' is much too contaminated by the notion of 'financial capital' – a notion, he argues, 'which is premised on unequal exchange' and which marginalizes students according to social and cultural conditions. Yosso's approach (2005), like that of the FoK approach (Rios-Aguilar et al., 2011), reconceptualizes and broadens the idea of what capital can mean in different cultural communities and reclaims the term in a new perspective.

Another theoretical context related to the FoK approach is the theory of third space or hybridity (Carlone & Johnson, 2012; Seiler, 2013) which could be positioned in what Hedges and Cullen (2012) call 'participatory learning theories'. The most positive aspect of this relationship is that it allows us to emphasize the contingent nature of FoK. That is to say, in these theoretical frameworks there is an underlying dynamic view of culture as a social construction located and distributed in contexts of activity. This overcomes the more static and homogeneous notions that tend to produce prejudiced and stereotypical views of student behaviour based on the simple fact of their being part of a particular cultural group. It should be noted, however, that the relationship between such theories and the FoK approach had already been suggested by Moje et al. (2004).

What can be highlighted as innovative is the relationship, of great importance in our view, between the FoK approach and the 'family literacy ecology of communities' framework (Chao & Mantero, 2014). In this model, the proposed setting for intervention in a meaningful context for participating families (in this case, Latino and Asian immigrant parents learning English) is the Church. The Church is conceptualized – in the same way as discussion groups are considered (Moll, 2015) – as the 'social mediator for situating immigrant adult English learners within real-life communities, empowering their family literacy, accessing communities of

power, and having a voice in the larger society' (Chao & Mantero, 2014, p. 90). In traditional FoK literature, the prototypical contexts that are objects of analysis and intervention are the school, the home (through visits) and the settings in which the study groups or discussion groups are held (usually, the same school or college). For Chao and Mantero (2014), the contexts of analysis and intervention are opened up to include significant settings that are depositaries and creators of FoK, such as the Church. This seems to be a novel contribution to the existing literature, and raises important questions regarding the inclusion of other agents and institutional contexts that may help to strengthen the educational continuities between the school, families and community.

Group 3. Developments and particularities of the FoK notion

The third group brings together particularities in the FoK approach that lead the authors to emphasize certain aspects, such as popular culture and the students' interests, as a source of curriculum content and as resources that can be used to link the students to the curriculum Petrone (2013) indentifies three ways of understanding the concept of popular culture: (a) as a site of identity formation for youth; (b) as a context for literacy development and (c) as a vehicle for sociopolitical critique and action.

Hedges and her colleagues (Hedges, 2011; Hedges, Cullen, & Jordan, 2011) focus on how popular culture and the interests of students can be a vehicle for extending curriculum design and practice beyond the child-centred, play-based learning environment. In addition to play, the authors identify other interests and motives – shaped by interaction with adults (teachers, parents, grandparents, etc.) and peer groups (friends, siblings, cousins, etc.) and in the experiences of everyday life, such as cooking or rugby – all of which can be incorporated into educational practice. In another article (Hedges, 2012) included in this group, Hedges suggests that, in addition to taking into account the children's FoK (the social and everyday contexts of children that shape their motives and interests), we should also consider their teachers' FoK (their previous experiences, beliefs and understandings) which, in the end, are mediating the activity in the classroom. According to the author, the informal knowledge accumulated by teachers throughout their careers and learning experiences, i.e. their FoK, end up exerting greater influence on their decision-making processes in early childhood education, compared to their theoretical and more formal training. In our opinion, these works also enrich the FoK notion since they emphasize the FoK and interests that students construct in their everyday practices. Clearly, the detection and incorporation of the funds knowledge of a particular family and community, along with data on the interests of students and an account of the teachers' FoK could lead to a more integral and powerful analysis than one that only takes into account the families' FoK, or the student's centres of interest.

Finally, an important element in this group is the notion of 'Funds of (difficult) knowledge' used by Becker (2014). Becker supports her argument with the concept of *dark FoK* (Zipin, 2009) and the notion of *difficult knowledge* ('stories that disturb one's sense of cohesiveness') suggested by Britzman (2000, p. 43), among others authors. The author places the word 'difficult' in brackets 'in order to recognize the mutable, constructed and subjective nature of what is considered difficult'. Specifically, in her explanation of the term, Becker proposes 'the term *funds of (difficult) knowledge* to account for the emotionally difficult chapters of one's cultural heritage or migration story' (Becker, 2014, p. 19). Traditionally, the FoK literature has emphasized only the positive aspects, such as skills and abilities, derived from family

and community experiences. This has led researchers to underestimate the weight of difficult experiences in building what Zipin called *dark FoK*. Having said that, however, the idea of *funds of (difficult) knowledge* or *dark FoK* can feed into the deficit thinking associated with certain groups at risk of social exclusion. As we said earlier, one of the purposes of the FoK approach is precisely this battle against deficit thinking in education.

Discussion

Our main objective was to identify the current state of research connected with the FoK approach, which we did by reviewing articles dated between 2011 and 2015 in the ERIC database. Specifically, we aimed to describe the existing literature, provide a critical analysis of developments, themes and limitations as well as identifying aspects that need to be taken into account in teacher candidates and teacher professional development.

We identified and described two categories of work: conceptual works (18 theoretical research-informed papers) and educational applications (74 educational research-based papers).

One of our aims was to describe the educational uses of the approach in relation to education, curriculum area and country in which the investigation was carried out and, as in the review of Hogg (2011) which covered the period between 1988 and 2011, the commonest settings were found to be elementary schools in the USA with the focus being mainly on literacy development. This is not surprising given that the original purpose and context of FoK research concerned language and literacy in elementary schools in the USA. However, new scenarios have appeared that were not identified by Hogg (2011), such as such as Uganda (Africa), the Republic of the Philippines, Tanzania, Chile and Mexico. Furthermore, the approach has been extended to other areas of education such as adult education and to other curricular areas such as geography, sustainability, social studies/social justice, technology and health – none of which were present in the papers that Hogg reviewed.

With regard to any new contributions and extensions to the FoK approach, there are three things we would like to highlight from our review. The first is that there are a number of connections between the FoK approach and other theoretical frameworks, among which the Community Cultural Wealth model proposed by Yosso (2005) is an especially significant example. A total of five articles critically explore the relationship between these two approaches (Hinton, 2015; Rios-Aguilar et al., 2011; Rodriguez, 2013; Saathoff, 2015; Zipin et al., 2015). We agree with the idea put forward by Rios-Aguilar et al. (2011) that what they call *forms of capital* is a notion that is complementary and compatible with *FoK*. However, the authors focus on only two forms of capital: *social capital* (resources embedded in social networks: parental involvement, family–school relationships, and so on) and *cultural capital* (involvement in cultural activities, parental cultural capital, *habitus*, language practices and educational/occupational aspirations). As we mentioned previously, we believe that the dialogue between these two perspectives should be broader – along the lines of Yosso (2005), who rearticulates Bourdieu's notion of cultural capital towards a more inclusive notion that recognizes the cultural experiences of certain communities, in her case, 'communities of color'. In particular, *community cultural wealth* is defined as 'an array of knowledge, skills, abilities and contacts possessed and utilized by communities of colour to survive and resist macro and micro-forms of oppression' (Yosso, 2005, p. 77). The notion of *FoK* also refers to this set of knowledge and skills, though this is limited to a particular family unit rather than

including an entire group or community. We think this distinction remains important because considering ethnic or cultural communities as a whole can lead researchers to obscure the diversity of skills and knowledge that may exist in a supposed cultural group, as well as perpetuating certain stereotypes (i.e. '*this* ethnic group has *this* cultural capital'). In this sense, maintaining the family unit as the unit of analysis seems more specific and consistent with the notion of culture – previously described (González, 1995; González et al., 2005) – that underpins the FoK approach.

Having said that, we believe that the literature reviewed shows that there is plenty of scope for a fruitful dialogue between the two models because it reveals a shared critical perspective aimed at social transformation in favour of inclusion and equality in education. We believe this dialogue can improve our understanding of the specific aspects that could be considered as repertories of skills and knowledge that are susceptible to being incorporated into educational practice and which are gathered from analyses of underrepresented groups. That is, many of the skills, experience and knowledge that families possess are recognized (as *FoK* or what Yosso calls the *family, linguistic and social capital*) but we also need to recognize other components of these FoK such as *aspirations* (as developed by Zipin and collaborators), skills associated with *resistance* and what Yosso (2005) identifies as *navigational capital* in reference to the skills of students in manoeuvring between different socio-cultural institutions. These ideas offer promising avenues for further research in FoK approach.

It is precisely this *navigational capital* that brings us to the second aspect of our review that we wish to highlight, namely the extension of the FoK concept by incorporating and expanding on the experiences, trajectories and social networks of learners that go beyond their family FoK. Good examples of this include the notion of *Funds of (difficult) knowledge* (Becker, 2014) and the notion *children's FoK-based interests* developed by Hedges et al. (Cooper & Hedges, 2014; Hedges, 2011, 2012, 2015; Hedges & Cullen, 2012; Hedges et al., 2011).

The first, developed in relation to the notion of *dark FoK* (Zipin, 2009) and *difficult Knowledge* (Britzman, 2000), is notable for drawing attention to the difficult circumstances or experiences endured by migrants. However, it meets the challenge of upholding one of the basic principles of the FoK approach, which is that people, above and beyond their linguistic, economic and socio-cultural differences, are competent individuals and they possess skills and knowledge that are embedded in their cultural practices. This principle seeks to call into question the *deficit perspective* which tends to associate families of immigrant origin, for example, with economic difficulties, unstructured environments, alcohol abuse and other negative elements. Although the school, as Zipin et al. (2015) suggests, cannot ignore the difficult circumstances of people from vulnerable socio-economic backgrounds, we think this view is correct and that it enriches the FoK approach.

We also believe that the notion of *children's FoK-based interests* developed by Hedges et al., in the interesting educational context of Aotearoa/New Zealand, can be linked to the notion of *funds of identity* (Esteban-Guitart, 2012; Esteban-Guitart & Moll, 2014a, 2014b; Jovés et al., 2015; Saubich & Esteban-Guitart, 2011). However, the funds of identity concept is not restricted to play, popular culture or children's interests – although these are highly relevant aspects – but rather, focuses on aspects and activities that are geographical (spaces), social (people), cultural (artefacts) or institutional (locations) and that each of us incorporate into

the vision we have of ourselves and of what, for each one of us, is significant and important.

Both notions invite us to consider the learner as the core of the educational activity, along with his or her multiple spaces of relationships, ranging from family to peer group. Based on students' interests or their funds of identity, the curriculum can be linked to their experiences, their artefacts and the contexts of their lives. We believe this notion also enriches the original FoK concept which, to a certain extent, was limited to family FoK generated by family practices. However, as Moll and his colleagues acknowledge, the existing research on FoK has informed educators and researchers primarily about *adult* practices and their social worlds (Rios-Aguilar et al., 2011).

> We have also long been aware that a funds of knowledge analysis, depending as it does on interviews with adults and participant observations in households, may inform us about adults and their social worlds but not necessarily about their children. We have often assumed, and it may be untenable, that what we learn from adults may inform us about children. (Moll, 2005, p. 279)

In our opinion, children/students create their own social worlds and FoK, which may be independent from the social life of the adults surrounding them. Both the *children's FoK-based interests* and their *funds of identity* allow us to take into account the children's social worlds, beyond the social life of the adults.

The third and final thing we would like to emphasize is the link between the FoK approach in general and social justice, which is apparent explicitly or implicitly in many of the works reviewed here and elsewhere (Rodriguez, 2013; Jovés et al., 2015). The FoK approach is linked to social transformation by the manner in which it understands the relationship between under-represented students and educational practice and culture. What underlies the various educational experiences reviewed here, whether in the realm of literacy (Cremin et al., 2012), mathematics (Aguirre, Zavala, & Katanyoutanant, 2012) or science (Licona, 2013), is how they explicitly recognize the life experiences of the students and their families and their way of life. And through this process of recognition and validation, school curricula can be adapted to these realities which are used as scaffolding material in the act of teaching and learning.

Finally, we decided to attempt to identify some of the significant contributions for teacher candidates and teacher professional development in the pedagogical context of educational inclusion and social justice.

We share the conclusion reached by Hogg (2011) who, in her review of the literature, said: 'FoK offers a conceptual framework for a key message for trainee teachers: first and foremost, know the learner. This message is compelling for teacher education programs with social justice aims' that are designed to help future teachers 'to work effectively in schools with increasing levels of student cultural diversity' (p. 674).

Knowing the learner is one of the teacher's central tasks according to this view – and this, in turn, means obtaining empirical knowledge of the contexts of their learners' lives, which in itself becomes a strategy for connecting with the territory and the community, a particularly sensitive aspect these days in which many teachers work in towns and areas they are unfamiliar with (Moll, 2015). The methodological innovations and strategies for doing this are, in our view, what differentiates the proposals described in this review from other perspectives (Shulman, 1986).

In this regard, in order to obtain this empirical information – a task which the pioneering authors of FoK situate in the field of ethnography (González et al., 2005) – teachers can

consider a number of different strategies or methodological resources, which in turn can become instruments or educational devices to connect students and their life contexts with the school curriculum. In our review of the literature, we identified several strategies that meet this aim: (a) *mentoring texts* (Newman, 2012); (b) *picture books* (Mantei & Kervin, 2014); (c) *student-generated photographies* (Coles-Ritchie, Monson, & Moses, 2015); (d) *digital media activities* (Gonsalves, 2014); (e) *cultural memory banking* (Handa & Tippins, 2012); (f) *e-readers* (Charbonneau-Gowdy, 2015); (g) *arts-based pedagogies* (Ward, 2013); (h) *family journals* (Rowe & Fain, 2013); (i) *photovoice* (Cook, 2014) or (j) *digital storytelling* (Pahl, 2011). Essentially, these consists of texts on which learners project their voices, their interests, experiences, knowledge and trajectories, and which teachers can use for educational purposes, as illustrated in the literature mentioned. For example, Mantei and Kervin (2014) illustrated the pedagogical usage of the picture book, *Mirror*, to make connections between personal experiences and school practice with students aged 9 and 10 as briefly described above. Students read *Mirror* independently, both individually and in pairs, and share interpretations of and personal connections to the protagonists of the history. After this first reading, students engaged independently with the picture book over one week, creating personal responses to something they related to in the text.

Moreover, this empirical knowledge of the reality of students is also the product and, at the same time, the result of establishing closer relationships with students and their families. This is a key element of the original FoK approach and is what underlines the teacher visits to the communities and homes of their students (Gonzalez & Moll, 2002). For this reason, the study group, as a learning community, is a perfectly positioned environment in which to develop and accompany teacher professional development (Jovés et al., 2015). However, this important part of the FoK approach goes unmentioned in many of the works reviewed here.

Conclusion

In short, although many years have now passed since the educational applications of the FoK approach were first put into practice (González, 1995; Vélez-Ibáñez & Greenberg, 1992), we can conclude that not only does the approach remain valid, but it has also incorporated elements of analysis that we believe enrich the original theoretical and educational model. In particular, our review illustrates some contemporary uses of and developments in the FoK approach, pointing out new groups or communities that can benefit from this approach (e.g. people with learning difficulties), new curricular areas (e.g. health, geography and sustainability) to which the FoK concept can be applied and new strategies for documenting FoK (e.g. through artefacts created by the learners themselves).

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