DELIVERABLE 2.1: REPORT ON USER REQUIREMENTS

0 INTRODUCTION

At the DigLIn kick-off meeting, which was held in Nijmegen, The Netherlands, on March 14-15 2013, all project partners presented the learning context of adult non-literate L2 learners in their respective countries with the purpose of finding a common ground for stimulating and practicing decoding skills. This report is the result of the language-specific presentations of the partners at this first meeting and the outcome of the discussion of three types of user requirements (related to the adult first time reader, to the reading context and to the pedagogical context) presented in the proposal and discussed at the first meeting. It provides an overview of the relevant characteristics of the various languages with respect to orthography-phonology correspondence, literacy teaching approaches and pedagogical traditions and a list of the selected requirements.

The report is built up as follows. We first describe some general characteristics of the target group that are relevant for this project (Section 1). We then describe the context of adult L2 literacy acquisition in the four countries, based on the presentations given by the partners at the kick-off meeting and additional information (Section 2-5). We then go on to present the pedagogical approach of FC Sprint[2] materials (see Deutekom, 2006) a new approach of (fast) learning Dutch as a second language which has also been used for literacy learning in Dutch as L2. This pedagogical approach (Section 6) is essentially the one underlying the materials we are going to develop for literacy acquisition in the DigLIn project. Finally, we describe the approach to literacy instruction and the general criteria for selecting words and exercises that we have agreed to use in the DigLIn system (Section 7).

1 THE TARGET GROUP

Europe has many immigrant and refugee adults with a low level of education, who lack basic skills such as reading and writing in both their native language and second language. However, the Common European Framework of Reference for Languages (CEFR; Council of Europe, 2001) departs from the basic level of primary school and implicitly assumes that adults are readers and writers. This does not correspond to reality. In addition to a high number of low-literate native-born adult residents, Europe counts many non-literate adults who need to learn to read and write for the first time in a language other than their mother tongue. The numbers of non-literates and low-literates (unable to read and write well enough to use these skills in their daily lives) differ from country to country, but are between 10–15% of the immigrant population. Poor oral and written proficiency in the second language leads to social exclusion (Bynner, 2001) and prohibits social and economic integration (Dustman & Fabbri, 2003). Literacy – the ability to use reading and writing– is clearly a key factor in the integration and participation of immigrants in the society in which they live.

Specific features of these adult first time readers are:

- they have barely attended school (often less than a year);
- they most often lack cognitive skills (acquired in school) which are implicitly required for many computer games and linguistic games;
- they are adults and do not want to engage in childish activities;
- they are not computer users.

The design of the DigLIn system is based on a thorough analysis of all factors and actors in the initial learning process of reading in a second language (L2) and on the identification of aspects amenable to change, i.e., enhancing decoding skills of adult L2 learners. An important step herein is the identification of user requirements. The partners have various experiences and views about the user requirements. The main purpose of the first discussion was to become familiar with the partner-specific context and requirements and make decisions about the requirements the exercises have to meet.

2 ADULT LITERACY ACQUISITION IN THE NETHERLANDS

2.1 PEDAGOGICAL TRADITIONS

The present situation in which literacy education for adults is organized in regional education centers dates from 1985 when the Act on Adult Basic Education was introduced. Before, small scale institutes and volunteers in community centers were engaged in teaching how to read and write in Dutch to immigrants and refugees who learned to read and write for the first time in their lives. With the introduction of this act the professionalization of SLA teachers started. Apart from a short module in the basic course for teachers of Dutch as a second language, no specialized training for literacy teachers was required. Many of them were primary school teachers who often considered their adult students similar to 6-year-old children. Due to compulsory schooling this attitude changed.

The curriculum was free, ABC materials were rare or non-existent, not very efficient and only rarely geared to adults. The first published materials for literacy education date from 1981 and 1989. Those were all paper books and were extended in the course of the 90s with exercises on tapes and CDs. Alternative and/or additional materials with more opportunities for individualization and differentiation appeared, culminating in the FC-Sprint^2 materials (2008) for non-literates and semi-literates in which the L2 literacy learner is invited to find his own way in a number of (re)sources, challenged by assignments in the form of word puzzles and texts (see the description of FC- Sprint^2 in Section 3).

Until the enactment of the Civil Integration Act in January 2007, the duration of a literacy program was generally 600 hours, equivalent to approximately 1.5 or 2 years of schooling. For most students, 600 hours of lessons (allotted to both written and oral skills) turned out to be not enough for reaching an acceptable level of reading and writing. See the report by Kurvers & Stockmann (2009) and the overview in English in the LESLLA proceedings (Kurvers, Stockmann & van de Craats, 2010). The last ten years of literacy education can be characterized by searching more efficient ways to speed up the learning process. These efforts range from individualization to focus on communication and the world outside the classroom and from tests geared to literacy learners to ICT materials. The DigLIn project can be seen in this light. (Computerized) self-study material is all the more important since all courses regarding to Civil Integration will no longer be offered by the municipality: the student will be responsible for the organization and the payment of his lessons. This regulation started in 2013 for all new entries. Since 2011 new arrivals –except refugees– already have a basic A1 level of reading since they have to pass a literacy test at the Dutch embassy or consulate in their native country before getting an entrance visa. The government has developed a toolkit with training materials which is far from efficient for non-literate candidates abroad (20 lessons on paper in order to become a reader in a new language). See Kurvers, van de Craats & Boon (to appear). Also in this light the results of the DigLIn project are important.

Literacy classes have always been rather heterogeneous groups with respect to nationality, native language, proficiency level of oral skills, and familiarity with a different type of an alphabetic or non-alphabetic script system. Until recently, most literacy classes were grouped according to the level of literacy determined through an intake test. In some cases, students were placed in different classes for oral skills and for reading and writing skills. In other cases the differentiation was restricted to the level of the class. Usually there were two teachers for the same class. They were teaching the class on different days of the week, but not at the same time. Assistants and volunteers might have assisted the teacher with practicing reading and small communicative speaking exercises. A couple of computers in the classroom or in an open learning center was often used in the bigger education

centers but they were usually unavailable to smaller classes in suburbs and small communities. Due to the new integration act and the way of sponsoring literacy courses, classes are getting smaller and more heterogeneous: non-literate and low-literate students and those with a non-Roman script are all together in one class. Traditionally, literacy students came from Turkey and Morocco, but nowadays also from Somalia, Iraq, Afghanistan, African countries and Thailand.

2.2 PHONOLOGY AND ORTHOGRAPHY OF DUTCH

Dutch has a relatively transparent orthography. Although Dutch is well-known for its consonant clusters (for example in <herfst>), it also has many CVC and even CV or VC words and as such Dutch is appropriate to an approach in which phonics plays the most important role.

There are many monosyllabic words with a CVC-pattern (consonant-vowel-consonant) consisting of 'pure sounds' (= not influenced in their pronunciation by the preceding or following sound). In order to crack the code starting with such words seems the best way.

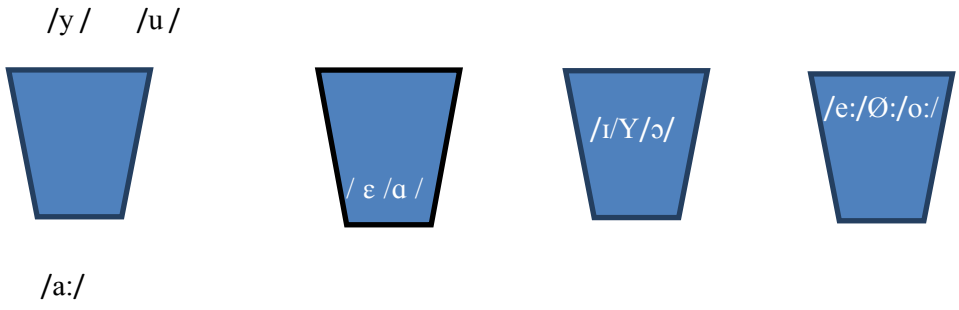
Examples: <jas> – <dak> – <pak> – <tak> – <tas> or <pet> – <pen> – <mes> – <bel>

Inventory of sounds: vowels

Dutch has 16 vowels, much more than most languages.

<a> – <e> – <i> – <o> - <u> and <aa> – <ee> – <ie> – <oo> - <uu> - <oe> - <eu> and schwa /ə/ written in various ways, and the diphthongs: <ij>/<ei>, <ou>/<au>, and <ui>. Vowels differ in sonority. Vowels differing most are those at the edges of the vowel triangle: they are written as: <ie> – <oe> – <aa> (in IPA symbols: /i /, /u /, /a:/) e.g. in: <biet> – <boek> – <paal> in Dutch. Below, the vowels have been put schematically in a triangle representing the mouth with the teeth to the left and the throat to the right.

high and low vowels	low vowels	middle vowel short	middle vowels long
(<ie> – <uu> - <oe> – <aa>)	(<e> – <a>)	(<i> – <u> – <o>)	(<ee> – <eu> – <oo>)



The three vowels (/i /, /u /, and /a:/) are most easy to distinguish (maximal distance) and are common in most languages and as such are serious candidates to start with. Most Dutch L2 literacy programs do not start with those sounds probably because their written form is not a single letter, but consists of two letters that together represent one sound/vowel (digraphs). There is one high central vowel which is not used in many languages: /y **/** written as <uu> or <u> (<muur> 'wall' and <u> 'you'). This vowel is difficult to pronounce for many learners with a language background like Spanish, Portuguese, English and many others.

Besides these 13 vowels, there are three diphthongs: /ɛi/, /œy/, and /ɑu/, written as <ij>/<ei>, <ui> and <au>/<ou> (in: <ijs>, <huis>, <kou>). They are pronounced low in the mouth: /ɛi/ in the front, /œy/ in the middle, and /ɑu/ backwards.

From previous research on pronunciation and/or reading errors by L2 learners (Kurvers & Van der Zouw, 1990; Van Heuven & Van Houten, 1985) we know that Moroccans tend to replace middle vowels by /u / and /i / and Turks tend to replace long vowels by short counterparts: /a:/ by /ɑ/ or /ɔ/. Kurvers & Van der Zouw found fewest errors with realization of <a>, <aa> and <ie> and most errors with the realization of <u> (/Y/).

Consonants

In the same way some consonants are more characteristic than others: e.g. voiceless plosives: <p> – <t> – <k> and nasals <m> and <n>. More difficult is to distinguish between consonants pairs, voice-voiceless: <k> – <g>, <t> –<d>, <p> – <b>, <f> – <v>. In total: <b>, <c>, <d>, <f>, <g>, <h>, <k>, <l>, <m>, <n>, <p>, (<q>,) <r>, <s>, <t>, <v>, <w> (,<x>) and <z> = 17 consonants and three digraphs: <ng>, <nk> and <ch>.

Some languages have a smaller repertoire of consonants: no <p> – <b> or <l> – <r> distinction, no Dutch <g> /ɣ /, and also the nasal /ŋ/ is lacking. The pronunciation of these consonants is an extra obstacle for beginning readers who are not familiar with them.

2.3 LITERACY TEACHING APPROACHES

In principle, there are three approaches for teaching reading:

- departing from the visual aspect: *synthetic methods*: <t>+<a>+<s> = <tas> ('bag')
  or from the auditory aspect: /t/ +/a/+ /s/ = /tas/
- departing from meaning: *global or sight word method*: <tas >
  analytic method: <tas> = <t>+<a>+<s>
- combination of the two: *eclectic* or *structure method*
  existing of: sight word – analysis – synthesis

Since around 1960, the third method – a combination of the first two methods – has been used most in primary schools in the Netherlands and since 1981 also in literacy education to nonnative speakers who learn to read for the first time. The sight word approach (or rather learning to read on the basis of one's own experiences, with one's own personal words –codifications in Paolo Freire's terms) has been used with native Dutch learners who had been attending primary school without much success with regard to reading. They say they feel like children when having to sound out words by blending the individual sounds. As for some reasons or other the structure method failed for them, the sight word approach is taken, but it is clear that the analysis of a word may be postponed to a later moment in the learning process, but cannot be completely skipped (cf. Flesh's (1955). *Why Johnny can't read and what you can do about it*, advocating the phonics approach).

For a language like Dutch with a rather shallow or transparent orthography, however, a phonics approach, more particularly the structure method, seems to be the most efficient and fastest way for cracking the alphabetic code. A prerequisite however, is that the target word is known by the learner. If this is not the case, the learner fails to get support from the mental representation of the word stored in his long term memory. Because the structure method is to be preferred for Dutch, only this method is presented in more detail.

Structure method

The primary aim of the structure method is grasping the structure of the spelling system or associating specific sounds (phonemes) with specific letters (graphemes). This is done on the basis of a whole word which is visually and auditorily structured in smaller units (***analysis***). In this way the student learns to consider a written word as a composite unit of separate elements and to make use of the systematics of letter-sound associations for autonomously decoding new words.

The basis of this method is a restricted number of ***concrete basic words*** the meaning of which is clear. Those words are presented in a context of a story or a picture story and learned by heart. Basic words should have '***pure sounds***', that is to say: those pure sounds are not influenced in their pronunciation by preceding or following sounds or by the fact that they are in word-final position.

Examples: <meer> ('more') sounds as /mir/ because the <r> influences the preceding sound.

<*geld*> ('money') sounds as /ɣɛlt/ because the word-final <d> is pronounced voiceless as /t/

<*ja*> ('yes') sounds as /ja:/ because in syllable-final position <aa> is written as <a> (/a:/).

Ideally, there is a one-to-one relationship between sound and letter. Many languages have too few graphemes for the repertoire of phonemes, which is the case for Dutch, but more particularly for English with one and the same grapheme representing different phonemes.

As soon as a couple of basic words is recognized the analysis and ***synthesis*** exercises can start. The spoken word is analyzed in sounds, the written word in letters. Next, the sounds are blended to a spoken word. Many analysis and blending exercises are needed for establishing a tight association between sound and letter. Software can help to automatize this phase of the reading process. For this stage, FC Sprint[2] has found many challenging exercises with feedback. The only feedback that is lacking is on reading aloud the sight words and the blended words.

The choice for basic words is primarily determined by the usefulness for the literacy instruction. Relevance of the word for adults and frequency of the chosen word are of secondary importance. The step to the reading of new words and the transition from spelling words to more automatization is supported by many exercises in which either the onset or the rime is kept constant, as in the series: <pak> – <zak> – <bak> – <tak> or <school> – <schep> – <schip>.

2.4 REFERENCES

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3 ADULT LITERACY ACQUISITION IN THE UNITED KINGDOM

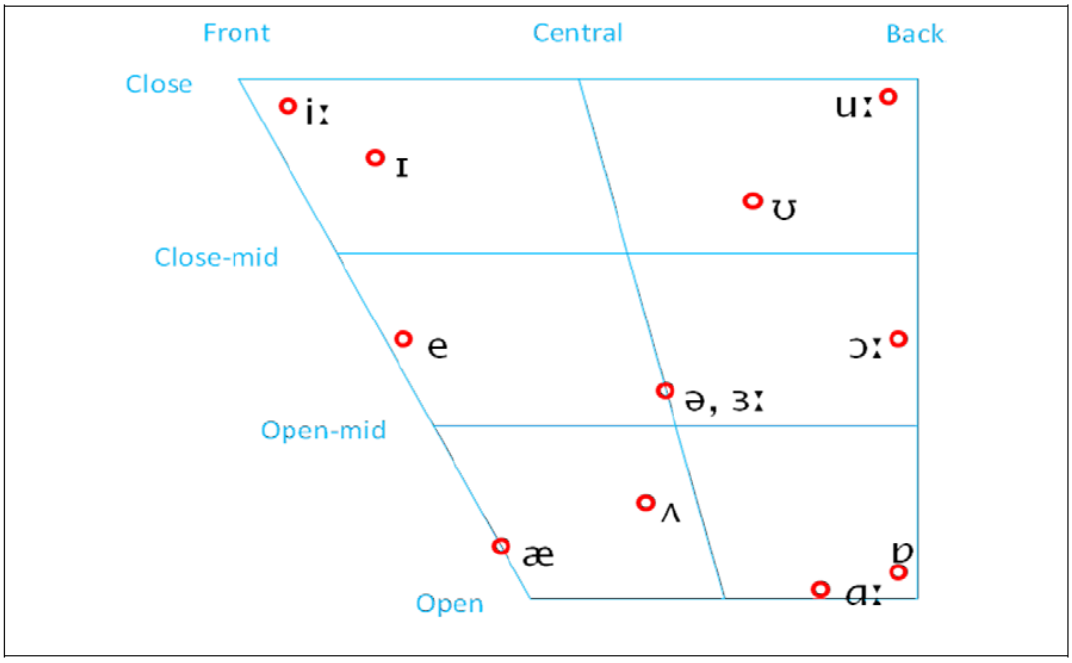
3.1 PEDAGOGICAL TRADITIONS

ESOL provision in England was initially ad hoc and voluntary in the 1950s and 1960s when South Asian immigrants began to resettle in greater numbers. Formal provision dates back to the 1970s when further education colleges began to organize classes. The first qualifications were set up and professional associations were established, for example the National Association of Teachers of English and Community Languages to Adults http://www.natecla.org.uk/ which holds an annual national conference, a range of other events throughout the year and publishes a newsletter and a journal, *Language Issues.* In the 2000s, adult ESOL was incorporated into a very well-funded programme, Skills for Life. This development brought with it a national curriculum, which excludes sub-A1 levels (A1 of the Common European Framework of Reference), a new teacher training framework and standards for teachers of basic skills in literacy and numeracy to native-speaking and ESOL adults. There is now a curriculum for basic skills for adults, but little is spelled out for LESLLA learners due to government funding mainly being attached to qualifications, and sub-A1 CEFR levels are not recognized qualifications (levels). A1 and A2 roughly map on to England's Entry 1 and Entry 2, and B1 and B2 map on to Entry 3 and Level 1. Pre-entry is a term used by ESOL teachers in the UK to refer to sub-A1 CEFR adults/LESLLA learners. Confusingly, however, in the current national curriculum, pre-entry refers to native speaking adults with learning disabilities. The general advice provided to teachers working with ESOL pre-entry-level learners is that they should individualize learning by using a range of strategies to differentiate learning and teaching according to learners' different skills and previous experiences of literacy and language learning and a range of approaches and classroom management techniques to differentiate learning and teaching according to learners' strengths and shared experiences; they should vary their delivery by using a range of specialist methods and techniques to support learners from a range of linguistic backgrounds and they should scaffold learning by employing approaches which foster collaborative learning, while being sensitive to the challenges such approaches pose for learners unfamiliar with them (see Cooke 2010). In so doing, they should support the learners in being able to respond to print as a source of meaning, becoming aware that words on the page represent words that can be spoken and reading texts for information and enjoyment. These could include a language experience text the learner has composed him/herself which the teacher has written down or a very simple or simplified notice. (See ESOL 2nd edition: www.excellencegateway.org.uk. Teachers in the UK after long pointed out how unrealistic this is (see e.g. discussion about UK pre-entry-level ESOL between April and May 2013 on the ESOL Research Forum user list).

3.2 PHONOLOGY AND ORTHOGRAPHY OF ENGLISH

The phonology of well-studied English is similar in many ways to that of two of the three DigLIn partner languages, Dutch and German, from its phonemic inventory to complexity of onsets and codas to presence of schwa. English has 24 consonant phonemes and (British English Received Pronunciation) 20 vowels eight of which are diphthongs. The orthography of English is considerably less regular than that of Dutch and German. English is widely known as the most opaque of all Roman alphabet orthographies, and children learning to read in English require more time to become proficient readers. While no systematic comparisons have been made (but should be) relatively slower reading progress will be true for emergent adult immigrant readers of English. Along with double letters and di- and trigraphs, the 26 single letters of the alphabet generally pattern with English phonemes as follows.

The Vowels of English



The Consonants of English

	Bilabial		Labio-dental		Dental		Alveolar		Palato-alveolar (Post-alveolar)		Palatal		Velar		Glottal	
Unvoiced (-V) *Voiced (+V)*	*-V*	*+V*	*-V*	*+V*	*-V*	*+V*	*-V*	*+V*	*-V*	*+V*	*-V*	*+V*	*-V*	*+V*	*-V*	*+V*
Stops (Plosives)	p	b					t	d					k	g	ʔ[1]	
Fricatives			f	v	θ	ð	s	z	ʃ	ʒ					h	
Affricates									ʧ	ʤ						
Nasals		m						n						ŋ		
Lateral (approximants)								l								
Approximants		w[2]						r				j		w[2]		

Vainikka (2013) notes that English orthography is highly complicated, where an estimated 50% of words in English are not governed by the basic sound-letter correspondence rules (see e.g. Carney 1997; Shappeck & Welch 2012) and that this has led to an on-going debate on how reading should be taught. Answers to whether some sort of phonics method be used or, given this 50%, reading should involve sight-word-memorization and rely on a whole word or whole language method vary depending on the decade. The English spelling system is the likely source of lack of documented reading progress in comparison with gains in math and science despite considerable effort (e.g. No Child Left Behind in the USA; National Literacy Strategy in the UK). Vainikka takes on the challenge of devising a small set of spelling rules to encompass irregular patterns. Bell's tables show the sub-patterns applying to a list of 6,800 common words which is based on several children's and adults' frequency lists. Of these 6,800 words, 3,500 – or about 50% - were exceptionally spelled. Where Cummins (1988) requires 555 pages and Bell (2004; see also Bell 2009) 70 pages of tables to present all the spelling rules for English, Vainikka distils regular and irregular spelling patterns into the set of 43 rules for monosyllabic, non-derived words.

In Vainikka's list of 43 rules, a consonant or vowel receives a predictability score. A rule or unified list correspondences receives a '1' when the rule is completely predictable and additional points are added for sub-rules. Application of this scoring yields the order shown below. Rules (grapheme-phoneme correspondences) are designated uniform when the same correspondence with a phoneme holds for that grapheme in all positions unless otherwise stated. Note there are some exceptions to all 43 rules, and this small set constitutes words that must be learned holistically, as sight words. The spelling of consonants in English is considerably more regular than the spelling of vowels, and the first nine rules revolve around consonants. It is not possible to strictly follow her order of rules due to the fact that words consist of both consonants and vowels. We deal with vowels from phonological competence perspective: it will be easier for NESLLA learners to distinguish cardinal vowels and wherever possible, these are used in the initial sets of words for the exercises.

Table 1. Vainikka's rules for consonants

Rule 1. <CC> = C That is, two adjacent instances of a consonant are read as one.
Rule 2. <b>, <g>, <h>, <k>, <l>, <s>, <w>, and <gh> can be silent.
Rule 3. The single consonants <b>, <d>, <f>, <k>, <l>, <m>, <n>, <p>, <r>, <t>, <v>, <z> are uniform.
Rule 4: The graphemes <ch>, <ck>, <ng>, <ph>, <sh> are uniform.
Rule 5: The following consonant clusters and digraphs are uniform <bl->, <br->, <dr->, <fl->, <fr->, <pl-> <pr->, <shr->, <tr->, <-mp>, <-nd>, <-nk>, <-ft>, <-nt>, <-pt> .
Rule 6. The consonants/graphemes <h>, <w>, <y>, <j>, <qu> are uniform at the beginning of a word, and <x> is uniform at the end of a word.
Rule 7. The grapheme <th> has two uniform pronunciations, voiced and voiceless.
Rule 8. The letter <s> has two uniform pronunciations, voiced and voiceless.
Rule 9: <c> is /s/ and <g> is <dž.> before <e>, <i> and <y>; <c> is /k/ and <g> is /g/ elsewhere.

Table 2. Vainikka's rules for vowels

Rule 10: The endings with vowel + <y> are uniform.
Rules 11-20: these refer to vowel + <r> and refer to rhotic, American English; Bell (2004) can be referred to for rules for British English Received Pronunciation.
Rule 21: The endings <a>, <ah>, <aw+>, and <awe> are uniform.
Rule 22: The ending <–al+> has three patterns.
Rule 23: In addition to the silent <e> usage, single <e> is pronounced as /i:/ and /ɛ/.
Rule 24: Single <y> in the middle of a word is pronounced either /ai/ or /I/.
Rule 25. A single <y> in the middle of a word is pronounced as /I/.

Rule 26: Single <a> is pronounced /e:/ in words with silent <e>, /a/ in words with /w/ in the onset and as /æ/ elsewhere.
Rule 27: Single <u> has variants: /ju/, /ʊ/ and /ʌ/.
Rule 28. Single <o> has the variants /u/, /ʌ/, /o/ and /ɔ/.
Rule 29: Digraph <ie> at the end of a short word is always /ai/.
Rule 30: <ee> and <ea> word-finally are always /i:/.
Rule 32: Word-final <oe>, <owe> and <ow> + C are always /o/ except for <ow> + C which in some words is /au/.
Rule 33: Word-final <ue> and <ew> + C are either /ju/ or /u/.
Rule 34. <ee> is always /i:/.
Rule 35. <ea> is always /i:/ initially, elsewhere it is /i:/ or /ɛ/.
Rule 36. <ie> is always /i:/ when not word-final.
Rule 37: <ai> and <ei> are always /e/.
Rule 38: Except when it contains a silent <gh>, <ugh> is always /f/.
Rule 39: Apart from rule 38, <au> is always /ɔu/.
Rule 40: <ui> is always /u/.
Rule 41: <oi> is /oi/ and <oa> is /o/.
Rule 42: <oo> is /ʊ/ or /u/.
Rule 43: <ou> is /u:/, /ʊ/, /ʌ/ or /o/.

3.3 LITERACY TEACHING APPROACHES

3.3.1 : CHILDREN

The irregularity of English orthography has sparked continuous and often acrimonious debate on how children should be taught to read; there is currently no more agreement on this than there has been in decades past. In countries such as England, where there is a national curriculum, this has meant regular shifts in the primary reading curriculum. Current guidelines for emergent child readers are that they should first learn by sight a set of 100 and then 200 of the most frequent words in children's books. Teachers are directed to use a synthetic phonics approach alongside sight word reading, where and to work with children to help them tune into, listen/remember and talk about sounds relating to the oral segmenting and blending of letters, starting with (1) <s>, <a>, <t>, <p>; (2) <i>, <n>, <m>, <d>; (3) <g>, <o>, <c>, <k>; (4) <ck>, <e>, <u>, <r>; (5) <h>, <b>, <f>, <ff>, <l>, <ll>, <ss>. When there is no national curriculum (and the teaching of phonics is not illegal, as it almost was in the US state of Massachusetts in the 1980s), teachers follow their intuitions about how best to introduce the irregularly spelled words alongside sight words. As noted above, there are several alternatives adopted by primary school teachers in other English-speaking countries in dealing with the division between the usually regularly spelled consonants and the irregularly spelled vowels. One well-known and extensive programme, *Jolly Phonics* (see e.g. Llyod and Wernman 2000), introduces letters in quite a different order, from <c > to <ar>, where the order would move from left to right, and then by rows.

Table 3. Introduction of letters in *Jolly Phonics*

c	a	d	G	o	q	s	f	e	i	l	t	u	y
r	n	h	M	b	k	p	ee	z	oo	j	ai	w	or
oa	v	x	Or	ch	sh	th	qu	ou	oi	ue	er	ar	

3.3.2 ADULT FIRST-TIME SECOND LANGUAGE READERS

Decisions on approach, method and technique in teaching reading are typically made by individual teachers. It is not unusual for such teachers to have had experience teaching children or non-immigrant low-educated adults to read and to then apply methods and materials designed for children such as *Jolly Phonics* shown above.

While there is a complex regime of training required in England to teach adults and to teach basic skills, there is no specific training to teach low-educated immigrant adults. Teaching therefore depends on teachers' past experience, what they discover on the internet, and what the knowledge and skills they gain by participating in user lists, attending conferences (such as NATECLA or LESLLA) and publications they might come across. For example, discussion on teaching low-educated adult immigrants to read in English in Lesgold and Welch-Ross (2012) echoes the points above (Cooke 2010; see also Wallace 2008), where teachers are advised to adopt ideas from teaching young immigrants and older educated second language learners. These ambitious ideas include (1) balanced and integrated focus on oral language, reading and writing; (2) meaningful, authentic and relevant materials/tasks; (3) use of learners' first language strengths; (4) focus on form and meaning; (5) frequent, explicit feedback; (6) opportunities to experience and apply linguistic structures in varied contexts; (7) sensitivity to learners' levels/readiness in introducing new concepts. Lesgold and Welch-Ross (2012) and a number of others (Birch 2002; Goldenberg et al. 2006; Sticht 2005); either neglect low-educated immigrant adults or note the lack of systematic evaluation of these ideas in their application to the teaching of basic skills for this group. An exception is on-going work by Condelli and colleagues (see e.g. Condelli et al. 2003). Another in the small set of researchers who has paid attention to low-educated adults' reading development in English is Aydin Durgonoglu, and she (pc, February 2013) recommends an analytic phonics approach under which rhymes are presented given that their patterns are more regular than for single vowels. This situation means that teachers cannot avail themselves of reports on evidence-based practice as there is nearly no evidence. A brief survey taken in March 2013 reveals how teachers in the UK are attempting to cope with the lack of solid, evidence-based advice and a dearth of materials designed specifically for this group of learners (Table 4).

It is not obvious how, taken together, English phonology, orthography and teaching practices for primary children and low-educated immigrant adults translate into guidelines for DigLIn's aim of creating software to build emergent readers' phonemic awareness. For this, sets of words are required. But which words? While English has numerous, highly frequent yet highly irregularly spelled words the reading of which is best learned by sight, including these in the software is problematic since frequency lists are based either on young children's books, adults' books or oral corpora involving native-speaking children or adults. Using Vainikka's rules as a starting point makes the best sense at the present time.

Table 4. How UK teachers teach low-educated adult immigrants

Approach to teaching reading	**Methods**	**Materials**	**Order of introducing grapheme-phoneme correspondences**	**Sources of materials/inspiration**
Eclectic	Sight word reading of relevant words	Self-written materials	Letters in name, other letters, first letter sounds, letter sounds for CVC words	The students and relevance to their interests and their goals.
	Environmental print	Realia	Primary school curriculum as guideline	The teacher learning another language (Polish; Urdu)
		flashcards		
Combination: synthetic phonics, more incidental, less structured using analytical phonics and whole world recognition and top down		alphabet charts		
	Primary school curriculum	*Sam and Pat* (US phonics stories)		
		Materials for dyslexic native speakers		
		Jolly Phonics		
		Welsh children's program to teach alphabet and sounds: with a click you hear the name of the letter, the sound and how to form it. You can click on the letters of your name or spell out words	None	*Literacy Plus* (Longman Pearson, for US market)
				SQA Literacy (Scotland)

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4 ADULT LITERACY ACQUISITION IN GERMANY

4.1 PEDAGOGICAL TRADITIONS IN GERMANY

The academic, educational and political interest in L2 literacy of adult immigrants in Germany started in the 90ies, but has increased rapidly since the introduction of a new immigration law in 2005 (Roll & Schramm, 2010: 6). In line with it, a system of *Integration Courses* has been established for both newly arriving and already settled adult L2 learners of German. In cases of evident need of integration and acquisition of German the government reimburses the learners for a major part of the course fee; the learner's contribution does not exceed 1,20 € per lesson.[1] For learners who came to Germany before 2005 and who receive financial support due to their unemployment, participating in an Intensive Course is compulsory and free of cost. Under the supervision of the Federal Office of Migration and Refugees (BAMF), public and private schools offer different kinds of Integration Courses, among which there is also a literacy programme. Its standard duration is 900 lessons, but learners have the possibility of taking 300 additional ones if they have not reached the B1 level. 45 lessons of *Orientation Course*, which takes place after 900 lessons of learning, aim at increasing the learners' knowledge about German society, politics and history.

The average length of stay in Germany of the participants in integration courses with a literacy component lies between 7 and 14 years (Schuller, Lochner & Rother, 2012: 6); this number hints at the rather limited number of L2 literacy course offers in the German educational system before 2005. With the new course system organized at the federal level, the tradition of basic L1 literacy of immigrants in Germany, which is considered to be an effective help for primarily illiterates, has almost entirely disappeared (Schramm, 2011: 224f). Since 2007, applicants for spouse visa have had to complete an A1 level test in their country of origin in order to obtain an allowance. This has started the practical necessity of teaching L2 German literacy in non-European countries as well (see http://www.goethe.de/lhr/prj/daz/inf/egn/deindex.htm).

Since 2005, over 65,000 immigrants have participated in integration courses with a literacy component, of which 72% are female (Schuller, Lochner & Rother, 2012: 59). Schuller, Lochner & Rother (2012: 6) have registered learners from about 53 different countries of origin, aged between 16 and 82. The most common mother tongues have been Kurdish (22%), Arabic (14%), Turkish (11%) and Russian (10%) (ibd.). According to their study, 73% of the learners in literacy courses came to Germany before 2005. Aside from the wide range of ages, mother tongues, social backgrounds and learning experiences, a main reason for heterogeneous learner groups is the presence of different literacy and oral L2 skills (Schramm & Feick, 2011: 92). Primarily illiterates (37,2%) are usually placed in the same classroom as functional illiterates in the L1 (20,3%) and advanced literates in a non-Roman alphabet (18,4%) (Schuller, Lochner & Rother, 2012: 36). Oral proficiency tends to lie between none and A2 knowledge in the beginning of a literacy course. Over 60% of the learners have not reached the A1 level before starting the course (ibd.: 43f).

The growing relevance of L2 adult literacy is also reflected by first doctoral dissertations (Pracht, 2010; Feldmeier, 2011; Waggershauser, *in preparation*) and the publication of an official curriculum for L2 literacy courses by the German Federal Office for Migration and Refugees (BAMF, 2009). Commercial publishers have reacted to these developments with a large number of textbooks and learning materials for L2 literacy courses for adult immigrants. Also, a major literacy learning

[1] See http://www.bamf.de/DE/Willkommen/DeutschLernen/Integrationskurse/TeilnahmeKosten/teilnahmekosten-node.html;jsessionid=0BA9823FFA5154B5EB3592EE278B49EE.1_cid368.

component has been integrated into the L2 learning website <https://www.ich-will-deutsch-lernen.de) which is being developed by the *Deutscher Volkshochschul-Verband e.V*. and is to be launched in August 2013. Current research projects in this field focus on the development of teaching methods[2], L2 literacy learner counselling[3], and work-related L2 literacy[4].

The number of qualification programmes for literacy teachers has also sharply increased (see, for example, Böttinger, 2010; Griepenburg, 2010; Heintze & Schramm, 2010). Funded by the Federal Office for Migration and Refugees (BAMF) for teachers of integration courses, these programmes comprise 80 lessons and will be an obligatory qualification for teachers in integration courses with a literacy component from January 2014 onwards. In this context, videobased teacher education materials have been developed in a joint effort of the Goethe-Institut and the Herder-Institut at Leipzig University (Feick, Pietzuch & Schramm, 2013).

4.2 CHARACTERISTICS OF GERMAN GRAPHEME-PHONEME CORRESPONDENCES

The writing system of German is more transparent than the English one, but fairly opaque if compared to Finnish. There is only one example of a true 1:1 grapheme-phoneme correspondence regardless of its position and surrounding letters that does not have an orthographic alternative: <au> and /aʊ/.

Apart from this case, literacy learners have to face a relatively opaque system of assignments. That is why it is important to differentiate between basic graphemes, which are the most frequent graphemic representations of phonemes (i.e. <e> for /e/), and ortho-graphemes, which are considered to be additional alternatives based on orthographic rules (i.e. the addition of <h> to a vowel like <eh> and a doubled vowel <ee> for /e:/) (Pracht, 2013: 41). Also the phonetic realisation of vowels is structured in a similar way. For instance, within the diverse possible realisations of <e> (/e/, /ɛ/ and /ə/), the phoneme /e:/ is considered to be the standardised assignment[5]. A so-called 1:1 correspondence refers to these norms.

One of the most significant characteristics is the influence of stress patterns on the German grapheme-phoneme correspondences. German words are built in trochaic patterns, which means that a stressed syllable is always followed by a reduced one. This is of main importance considering that quality of consonants and vowels changes depending on their placement in a word and position within a syllable. A well-known result of unstressed syllables is the *schwa.* Whenever the grapheme <e> appears in an unstressed syllable, its phonetic value changes from the usual /e/ or /ɛ/ to the reduced version /ə/. Its combination with the grapheme <r> in an unstressed syllable turns the <er> into /ɐ/ (Pracht, 2012).

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[2] *AlphaMar I*, Marburg University, see <http://www.uni-marburg.de/fb09/igs/arbeitsgruppen/daf/alphamar>.
[3] *LeLeBe*, Leipzig University, see <http://*www.uni-leipzig.de/lelebe*>.
[4] *Alphaportfolio*, Münster University, see <http://www.alphabund.de/1513.php, and *AlphaMar 2*, Marburg University: http://www.alphabund.de/1518.php>.
[5] Norm within vowels: <a> - /ɑ:/, <i> - /i:/, <o> - /o:/, <u> - /u:/, <ä> - /æ:/, <ö> - /ø:/, <ü> - /y:/.

Several consonantal phonemes have two or more graphemes assigned, without its phonemic value being changed. <n> and <nn>, for instance, will always be pronounced as /n/. In spite of that, the orthographic distinction is relevant because double consonants connect syllables so strongly that a clear separation is inhibited and that the second syllable imposes on the first one (Pracht, 2012: 9). This characteristic German syllable structure results in a different form and place of articulation of the preceding vowel. The combination <on> will usually result in /on/, but <onn> in /ɔn/. According to that scheme <a>, <e>, <i> and <u> become /a/, /ɛ/, /ɪ/ and /ʊ/ in stressed syllables followed by double consonants.

A similar indication is given by <h> and the doubling of vocalic graphemes, which refer to the length of the preceding vowel if it appears in the same syllable, i.e. <geh-en> becomes /geːən/, while <ge-heim> becomes /gəhaɪm/. <Beet> is pronounced /beːt/, while <be-en-den> becomes /bəɛndən/.

There are three main diphthongs in German: /aʊ/, /aɪ/ and /ɔɪ/. In contrast to the above mentioned /aʊ/, /aɪ/ can be orthographically represented by the standardised <ei> or by <eih> as well as by <ai>. Also /ɔɪ/ can be found written either as <eu> or <äu>. As mentioned with respect to *schwa*-syllables, <r> can appear with vocalic qualities. Whenever it is combined with directly preceding vowels in the end-position of a syllable, a diphthong is pronounced, i.e. <mor-gen> is pronounced /moɐgən/, but <fah-ren> becomes /fɑːrən/.

The consonantal system of German is much more transparent in terms of phonetic diversity than the vocalic. Its main characteristic is the great number of orthographic variations that can represent a phoneme. /f/, for instance, corresponds to <f>, <ff>, <ph> and in some words <v>. Furthermore, German shows a high number of frequent consonant clusters, which can be divided into two categories. The simpler one contains clusters that have, or almost have, a 1:1 grapheme-phoneme correspondence like <kr> and /kr/ or <tz> and /ts/. The second category of consonant clusters has different variations of correspondences: 2:1 as in <ng> and /ŋ/ or 3:1 as in <sch> and /ʃ/.

The quality of most consonants does not depend on either their position in words and syllables or on stress patterns. In spite of this, there is a number of special cases like the mentioned functions of <h> and <r>. Voiced consonants, for instance, lose their voicing in coda positions, i.e. <Tag> - /Tɑːk/, <Hund> - /Hʊnt/, <Raub> - /Raʊp/, or before other voiceless consonants, i.e. <tagsüber> - /tɑːksybɐ/. A dependency on the surrounding phonemes is shown by the grapheme <ch>. Its phonetic value can either be /ç/ or /x/ when it appears in the middle or coda of a word. If it follows phonemes which are represented by <a>, <o> and <u>, /x/ is pronounced, i.e. <lachen> - /laxən/, <Buch> - /buːx/. All remaining combinations lead to /ç/, i.e. <Mädchen> - /mætçən/. In contrast, <ch> as an onset can be pronounced either as /ʃ/ (<Chef>), /tʃ/ (<Chilli>), /ç/ (<China>) or /k/ (<China>). Often there are many legitimate options for the phonetic realisation like in <China>.

A rather complex phoneme-grapheme relation persists in the usage of the graphemes <s>, <ß>, <ss> and related constructions. <s> can be assigned either to /s/ or /z/, while <ß> and <ss> only correspond to /s/. Which of both is used in which contexts, depends on surrounding vowels and the position within a syllable. <s> in the beginning of a syllable indicates that /z/ is pronounced, i.e. <le-sen> - /leːzən/, <So-fa> - /zoːfa/. When an /s/ is pronounced after a vowel, <ß> indicates a long and

<ss> (or in some cases <s>) a short realisation of the vowel. Syllables starting with the cluster <st> and <sp> change the phonemes into /ʃ/, i.e. /ʃt/ and /ʃp/.

This brief summary has only focused on a number of examples to illustrate the rather opaque system of German orthography. The knowledge about relevant factors such as a phoneme's position within a word and within a syllable as well as the effect of surrounding phonemes may help to comprehend German orthography.

4.3 LITERACY TEACHING APPROACHES IN GERMANY

Even though research on L2 literacy methodology is still too young to speak of a teaching tradition, several approaches are being considered to be more preferable than others. According to Rokitzki, Nestler & Sokolowsky (2013: 91), there are four main approaches to teaching literacy in Germany: through grapheme-phoneme assignments, stress patterns, syllables or morphemes. These are typically seen as the four most meaningful units when it comes to analysing German words.

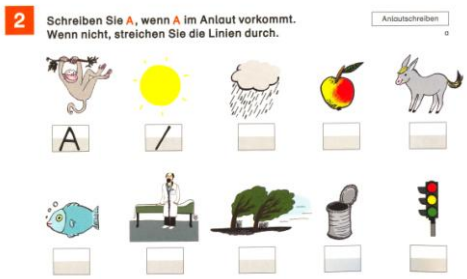

IMAGE 1(Alphamar, Kursbuch, 2011: 6)

The smallest units are referred to within the very common **grapheme-phoneme correspondence approach**. There are numerous ways to teach and learn with isolated phonemes and graphemes. The most commonly implemented of these are analytic methods, which depart from whole words and their meaning. A frequent starting point is the focus on onsets and codas (see *image 1*)[6]. Learners will memorise graphemes in relation to an object or a visual representation (picture or drawing) and pronounce it, whilst concentrating on the onset. Of course, linking letters with interjections, which can be physically experienced in the classroom, is also a desirable, holistic way of assignment. Similarly, directing the focus towards learners' own articulation systems is considered to be an effective holistic approach, which has to be treated carefully in respect of learners' sense of shame and inhibitions (Heyn, 2010: 50).

On the basis of newly gained knowledge, regular assignment tasks on paper aid memorising and automatizing the phoneme-grapheme correspondences. Widely spread activities aim at discriminating phonemes and arranging or recognising their graphemic equivalents, rearranging a sequence of graphemes or simply finding, for example (see *image 2*), all graphemic options for one phoneme (/f/ - <f>, <ff>, <v>, <ph>) or the other way around (<s> - /s/ or /z/). These analytic procedures certainly have great potential for training the pronunciation of isolated patterns, but their implementation is often followed by learner difficulties in synthesising to syllables or full words. That is why exercises on the synthesis of graphemes or phonemes should also be taken into consideration.

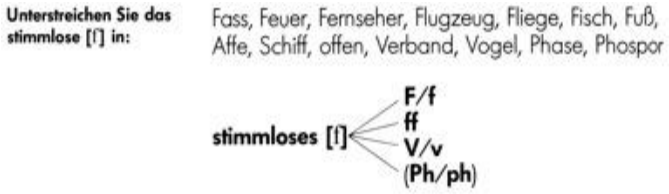

IMAGE 2 (Projekt Alphabet Neu, 2004: 154)

[6] We thank Klett and Langenscheidt Verlag for granting permission to include images 1-3.

The main focus of the **syllable-oriented approach** is automating learners' ability to combine auditive with visual perception and, consequently, spoken with written language. Words are introduced to learners as sequences of syllables without a previous need for synthesis of isolated phonemes. Isolated nonsense syllables such as <ma>, <mo>, <mu> etc. are also used, but not preferable due to their lack of relevance to the learners. According to Montessori's (1969, 1998) and Kamper's (1985) approaches, learners are encouraged to accompany the pronouncing of syllables with rhythmic clapping, walking or swinging. In reading activities, visual support is given by bows below words, which separate their syllables (see *image 3*).

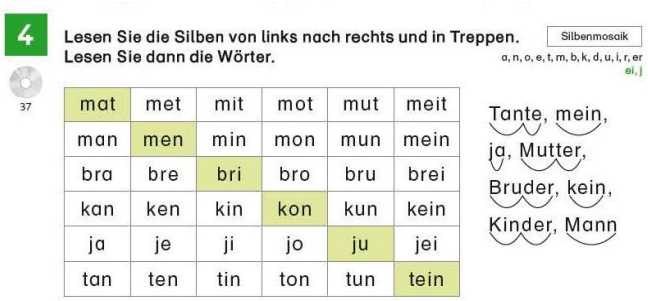

IMAGE 3 (Alphamar, Kursbuch, 2011: 54)

That teaching approach overlaps with Paulo Freire's (1973, 1977) methods inasmuch as it is thought that syllables should form the main point of interest in literacy classes. Nevertheless, unlike Freire's mother tongue Portuguese, German is not a syllabic language and the required simply structured syllables are rare. A common progression in German starts with words containing sonorant consonants (<m>, <l>, <sch> etc.), vowels with a 1:1 correspondence with their phonemes (<o> when pronounced as /o/) and no consonant clusters. However, *schwa*-syllables are introduced to the learners from the very beginning ("Na-se") in order to accustom them to this common characteristic. Due to the lack of simply structured words, more complex phonemes are often presented in an early stage of learning, i.e. plosives as in "To-ma-te". A significant disadvantage of this approach is that the usage of isolated and consequently stressed syllables leads to the loss of authentic emphasis within words.

As mentioned above, phonetic changes caused by **stress patterns** are very present in German vocabulary. Learners can benefit from analysing them inasmuch as this facilitates comprehension of grapheme-phoneme correspondences in its foundation. Röber (2006, 2009) and Bredel (2009) have developed a visualisation scheme in order to build up awareness of German stress patterns. Per word there is a drawing of a house followed by a garage shaped image. Each drawing is divided into several squares of different sizes. The letters of a word can be written into these squares. The house shape is bigger than the garage and it represents a stressed syllable, within which the vowel core has to be placed in the larger field showing that the stressed vowel has a lot of room to be pronounced ("long vowels"). In case of, for instance, "Na-me" the <a> would be put in the biggest slot. This could mean <a>, but also <ah> or <aa>, which are all graphemes of /ɑ:/. The so-called *garage* contains the reduced syllable. The consonant <m> would fill the first square of the garage and the following fields with a *schwa* as in this case <e>. A grey background in the last square can emphasize the reduction of <e>. Of course, the model can be modified and extended depending on the words being trained. Another variant of this conceptual approach is the introduction and constant use of big and small circles standing for stressed or unstressed syllables.

The **morpheme-oriented approach** encourages learners to disassemble words into typical elements such as prefixes, stems and suffixes. German morphemes tend to be constant in their phonologic and graphemic quality, which is why they are a trustworthy access to orthography. Functional morphemes are often implemented in exercises due to their great frequency within written and spoken language. The frequently used German past tense *Perfekt*, for instance, consists of an auxiliary verb and a participle like "gekocht" or "abgelaufen", which in most cases contains the initial or central morpheme [ge-]/[-ge-] and the coda [-t] or [-en]. Therefore, <ge> and its phonological

equivalent /gə/ (i.e. also <t> and /t/, <en> and /ən/) are examples of relevant and constant functional morphemes that can be introduced to encourage learners' awareness of typical schemes within orthography. Another advantage of that approach is shown by the example of the compound *Fahrrad* (bicycle). The presence of the doubled consonant i.e. <rr> cannot be perceived phonetically, but a morphologic analysis helps to retrace its origin [fahr] + [rad] and, as a result, to comprehend the orthographic necessity of a doubled consonant.

The morpheme-oriented approach is considered to be useful at a more advanced stage of learning since students need to know all letters and be able to synthesise them into words. Advanced learners can benefit from the analysis of word structures in terms of becoming familiar with orthographic and phonologic qualities of common morphemes. Furthermore, the ability to disassemble a word into its different elements helps learners to decode long and complex words more quickly.

Unfortunately, German contains a significant number of words with irregularities, (currently) meaningless morphemes and words the morphemic analysis of which confuses rather than benefits the learner. That is why literacy classes should not be based entirely on the morphemic approach. This, however, in principle applies for all four methods mentioned here.

The concrete social use of literacy in the classroom is focused on within learner-oriented approaches such as *Reading through Writing*, the *Language Experience Approach* or Paulo Freire's emancipatory approach (Rokitzki, Nestler & Drecoll, 2013: 110). The three methods aim at placing the learners' interests and needs in the centre of attention. The progression of word introduction is therefore chosen by the individual learners. Teachers provide material and assistance, but they also offer a higher level of tolerance to errors and liberty for creativeness as well as encourage the group to social interaction.

Unfortunately, empirical research on L2 adult literacy acquisition is still scarce. In order to help learners acquire a broad range of knowledge and skills, it is therefore considered to be recommendable to combine the methods presented here in an eclectic approach and observe the effect on individual learners in action research.

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5 ADULT LITERACY ACQUISITION IN *FINLAND*

5.1 PEDAGOGICAL TRADITIONS

In Finland, literacy training for immigrants has been provided since 1980's, at first in bigger towns like Helsinki and Turku. The first national curriculum recommendation for literacy training was published in 1993. Nowadays, most of the literacy instruction for adult immigrants is labour market training for registered job seekers. It is free of charge, and the education providers are usually adult education centers which provide many kinds of labor market training for all the people living in the country. Since June 2012, all this kind of literacy training must be provided according to the National Core Curriculum for Literacy Training for Adult Migrants (2012) provided by the Finnish National Board of Education.[7]

Each literacy training provider should draw up its own curriculum on the basis of the National Core Curriculum. The local curriculum may include regional or sub-regional, municipal and institution-specific sections, and thus there is much variation.

According to the National Core Curriculum, "Each student's baseline level is assessed at the beginning of literacy training to guide the student towards a suitable module or teaching group. Placement testings determine students' oral Finnish/Swedish[8] language skills, recognition of letters and reading, fine motor control, text reproduction, writing from dictation and arithmetic skills. In addition, assessments involve determining students' learning and study skills, willingness and motivation to study, memorisation and absorption skills, as well as their educational background, all-round learning, work history and other competencies. Where necessary, placement testings are carried out using interpreting services." and "Placement testings should take into account the fact that students' language skills profiles may be quite uneven for various reasons; their oral language skills and reading and writing skills may even be at considerably different levels." (p. 12.)

In the National Core Curriculum, it is also stated that "The average duration of literacy training for adult migrants provided in compliance with this National Core Curriculum is 160–200 days, depending on each student's needs. This amounts to a total of 32–40 credits, equating to 1,120–1,400 lesson hours. One credit is equivalent to about 35 hours of a student's work. Direct contact teaching and distance learning or guidance counselling are provided for 5 and 2 hours per day, respectively. Consequently, the training programme lasts one school year and it is advisable to divide it into 2–4 modules." (p.11.)

The literacy classes are usually rather heterogeneous groups of non-literate, low-literate, and non-alphabetic literate students. The number of students in one class may vary a lot. However, the maximum number of 15 students is recommended by the National Board of Education. Students come e.g. from Somalia, Iraq, Iran, Turkey, Afghanistan, Vietnam, and Thailand, and most of them are women (see Tammelin-Laine, 2011). In 2011, a total number of around 1,250 students participated in literacy training in the country (Nissilä & Immonen-Oikkonen, 2012).

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[7] National Core Curriculum is available in English at http://www.oph.fi/download/140756_national_core_curriculum_for_literacy_training_for_adult_immigrants_2012.pdf

[8] Finnish and Swedish are both official languages in Finland, with equal status in legislation. In this document only Finnish is discussed.

Usually there is only one teacher in the classroom and assistant teachers or tutors are rarely used. The themes to be studied are connected to everyday life (e.g. health and well-being, personal life, basic everyday services). The materials teachers usually use in their work vary a lot because most of them make and use their own materials. The reason for this is the lack of teaching materials for literacy training in Finnish. At the moment, there are only one ABC book for adults and a couple of other teaching materials some teachers use to some extent. It is especially difficult to find any listening comprehension materials for CEFR level A1.1 and below. The situation may improve a bit by the end of the year 2013 when the material of project VILU (virtual supportive material for learning literacy skills) is likely to be ready for use.

For house-wives, elderly, and other groups of immigrants who are not registered job seekers the literacy training is usually organized by municipal social services or NGOs like *Luetaan yhdessä – verkosto* ('Let's read together network'). That kind of training is usually led by volunteers who are usually not qualified (Finnish) teachers.

5.2 PHONOLOGY AND ORTHOGRAPHY OF FINNISH

The relationship between the Finnish sounds and letters is quite straightforward: each short sound is represented with one letter, each long sound with two letters. The exceptions are very few and are listed below. (For further details on Finnish sound structure see e.g. Suomi, Toivanen, & Ylitalo, 2008; Karlsson, 2008; Sajavaara & Dufva, 2001.)

The Finnish vowel sounds are: /ɑ/, /e/, /i/, /o/, /u/, /y/, /æ/, /œ/ and the corresponding letters <a>, <e>, <i>, <o>, <u>, <y>, <ä>, <ö>. All vowels can be phonemically long and short, without any change in quality, spelled <aa>, <ee>, <ii>, <oo>, <uu>, <yy>, <ää>, <öö> and appearing in minimal pairs (e.g. <te> 'you' – <tee> 'tea'). The letter <å>, pronounced as /o/, is listed in the Finnish alphabet and is found in names of Swedish origin. There is a rule called vowel harmony in Finnish: a single word can only contain front vowels (<ä>, <ö>, <y>) together with neutral vowels (<e>, <i>) or back vowels (<a>, <o>, <u>) with neutral vowels. Thus no non-compound word can have e.g. both <u> and <y>. Inflectional suffixes containing a back/front vowel thus have a variant with the counterpart: <a>/<ä>, <o>/<ö>, <u>/<y>, e.g. <talo>+<ssa> 'in a house', <metsä>+<ssä> 'in a forest'. Word stems containing only neutral vowels usually have the front vowel variant of the suffixes, e.g. <tie>+<llä> 'on a road'.

The vowels also combine as diphthongs: <ai>, <ei>, <oi>, <ui>, <yi>, <äi>, <öi>, <au>, <eu>, <iu>, <ou>, <äy>, <ey>, <iy>, <öy>, <ie>, <uo>, <öy>. Each part of the diphthong is pronounced as the individual vowel but gliding them together, with no syllable border. There is no consistent difference in the length of the two parts of the diphthong. There are also other vowel combinations where two vowels are next to each other but belong to two syllables (e.g. <ko.e> 'test'). These are usually results of consonant gradation (see below) where a syllable initial consonant is not present.

The Finnish consonant sounds are: /d/, /h/, /j/, /k/, /l/, /m/, /n/, /ŋ/, /p/, /r/, /s/, /t/, /v/, spelled with the same letters, except for /ŋ/ (see below). The status of /d/ differs from other consonants in that it cannot occur in a word-initial or -final position. In addition /b/, /f/, /g/, /š/ can be pronounced in words of foreign origin. Other letters of the Latin alphabet (e.g. <c>, <q>, <w>) are used as necessary for spelling foreign names etc.

Like vowels, all consonants can be short or long, although /hh/, /jj/, /vv/ are rare. The unvoiced stops /k/, /p/, /t/ and their long counterparts /kk/, /pp/, /tt/ form the core of the consonant gradation system. Many word stems alternate between the long (strong grade) and short (weak grade)

consonant in inflectional paradigms: <kukka> (NOM ‘flower’) : <kuka>+<n> (GEN) : <kukka>+<a> (PART) : <kuka>+<ssa> (INE) : <kukk>+<i>+<a> (PART pl) etc. Originally consonant gradation was a matter of open and closed syllables (open syllable preceded by strong grade, closed by weak grade) but over the centuries sound changes have clouded the picture to the extent that consonant gradation is now normally explained (and taught) as a morphological phenomenon, with certain inflectional forms being accompanied with strong/weak stem.

In addition to the quantitative consonant gradation /k/, /p/, /t/ also undergo qualitative consonant gradation, e.g. <katu> (NOM ‘street’) : < kadu>+<n> (GEN); <puku> (NOM ‘dress’) : <puvu>+<n> (GEN); <vika> (NOM ‘fault’) : <vi.a>+<n> (GEN). Combinations of consonants undergo many different types of changes, e.g. <ilta> (NOM ‘evening’) : <illa>+<n> (GEN); <kampa> (NOM ‘comb’) : <kamma>+<n> (GEN). Consonant gradation is quite productive in Finnish, with particularly the quantitative gradation affecting even the newest loan words.

Distinguishing the voiced and voiceless consonants is not easy for the Finns, which means that quite often there is no difference in oral production between <bussi> ‘bus’ and <pussi> ‘bag’. Another exception in spelling is the sound /ŋ/ which is spelled with <n> before <k> (/keŋkä/, <kenkä> ‘shoe’) and with <ng> when long (/ŋŋ/, /keŋŋät/, <kengät> ‘shoes’). Finally, in some standard Finnish contexts the final sound of a word ending in a vowel when pronounced alone doubles with the initial consonant of the following word, e.g. /sadettakki/, <sadetakki> ‘rain’+‘coat’. This consonant doubling is not spelled as it varies from one context to another (cf. /sadeppäivä/ <sadepäivä> ‘rain’+‘day’ ‘rainy day’). Other types of assimilations are not spelled, either.

The main stress in Finnish is always on the first syllable, secondary stress on the third, fifth etc. syllable, except for compounds. Stress and length are not interrelated: short syllables can be stressed and long syllables unstressed. Intonation is not used to distinguish meanings.

5.3 LITERACY TEACHING APPROACHES

In practice, literacy teaching approaches depend on the available resources and the teacher. Both activity-based and text-based methods are used. That means some teachers focus on reading skills, some prefer the focus on oral skills which make the foundation for reading.

Literacy training of Finnish can be divided into two: the phonics-based (skill-based) approach and the meaning-based approach. The **phonics-based approach** emphasizes the systematic use of phonics in learning to read. The main focus of reading instruction is then on the letter-sound correspondence. The main idea of this approach is to learn to slide from phoneme to phoneme to blend the phonemes into words (Lerkkanen, 2003: 26–27). It is very effective for Finnish speaking children, and often used also for immigrant adults. However, the emergent reader has to understand the meaning of the words he/she is learning to read with, otherwise it is impossible for him/her to evaluate the reading process and the accuracy of the result. For that reason, the emergent readers should first learn and memorize at least some words and their meaning by heart. According to Lerkkanen (2003: 27), the **meaning-based approach** is a whole-word-method with focus on the semantic content. Because of the Finnish inflection system and many long words it is usually used only in combination with the skill-based approach. Learning to read words by sight is not very useful when each semantic unit can appear in many different forms (e.g. <käsi> ‘hand’ : <kädet> ‘the hands’ : <kaksi kättä> ‘two hands’). Only frequently used names and words are learned as whole-words but the main focus of literacy learning is kept in phonics-based letter-sound correspondences.

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6 PEDAGOGICAL APPROACH OF FC SPRINT²

6.1 GENERAL PRINCIPLES

As the DigLIn system will basically make use of the learner system of FC-Sprint² materials, we introduce the most characteristic pedagogical ideas behind the learning concept of FC-Sprint²

If there is one quote that fits the concept of FC-Sprint² it is probably this one:

> *The greatest danger for most of us is not that our aim is too high and we miss it, but that it is too low and we reach it. (Michelangelo)*

The concept of FC-Sprint² is based on two pillars of thought:

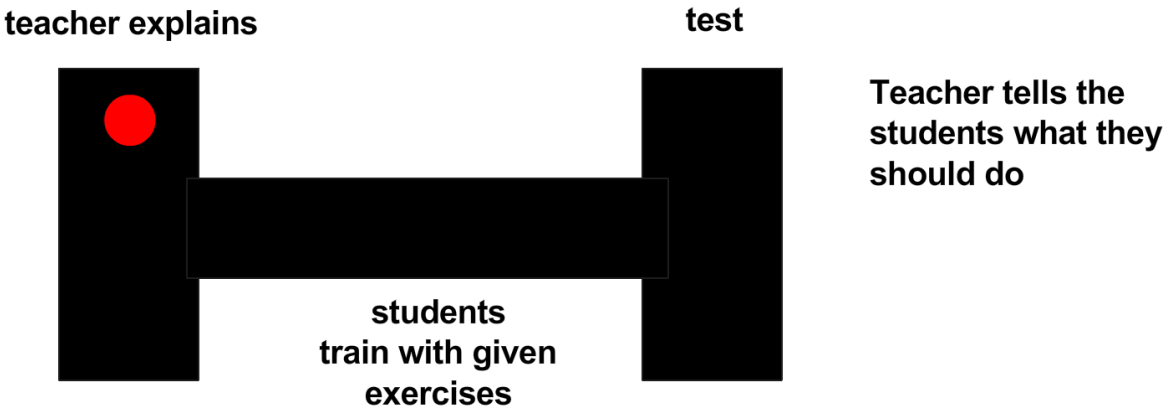
1 *A different approach to students by teachers, moving from control by the teacher to autonomy for the students.*

We start with what we call high expectations. This involves *not* telling the students what they should do. Instead we ask them what they can show us and we convey to them the idea that we are sure they will impress us. We then ask them to present to their classmates what they have learned. This requires students to work with the resources the teacher has made available, which range from books and audio-recordings, to their classmates. The teacher should be the last resort. That is, if the required knowledge is really not available from any of these resources, the teacher can be a resource. This makes it much easier to work with heterogeneous groups. In fact, when we see other students as valuable resources, heterogeneous groups are needed. In that way, developing skills in a second language is to be viewed as teamwork.

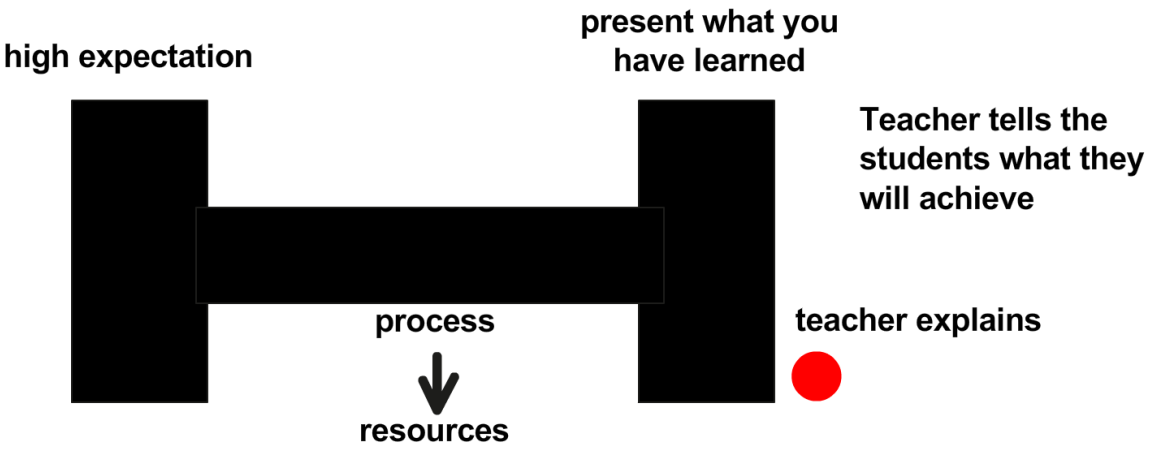
2 *Providing students with resources so that they can become more autonomous learners.*

A large part of these resources are built by advanced students of the school for advanced vocational education at Friesland College in Leeuwarden and some teachers from the *Application Development* and *Media Design* tracks there. They together try to build small programs so that other students - in this case literacy learners from the educational department where Dutch as an L2 is being taught as well as literacy for first time readers in Dutch as L2 - can find themselves the materials needed for autonomously discovering how to read, instead of being taken by the hand by their teacher.

This is roughly what traditional teaching looks like:



And this is what we do in FC Sprint[2]:



6.2 MORE SPECIFIC VIEWPOINTS

1 *Behavior is determined by the environment.*

This is basically about the effect of the teacher/school behavior on students. For instance, if a teacher explains a concept thoroughly until he is sure the whole group of students understands, responsibility for learning is removed from the students, and passive learning will be promoted. The behavior that a teacher really wants to see is a student who asks questions when she/he does not understand (very important when a new language is learned).

2 *Learning efficiency grows when the student is responsible for his/her learning*

3 *Learning is doing things that you cannot do yet.*

Many teachers are overly careful and try to prevent mistakes being made. If one observes a random classroom, one often sees a lot of coping behavior (that is so say: application of what has been instructed) but little learning (that is: working out what students cannot yet do).

4 *A student needs to make mistakes in order to learn.*

5 *Learning is more effective when students feel more the need to learn, for example when they have to present what they have learned to their classmates, than when they have to take an individual test.*

The FC-Sprint[2] materials allow the students to practice on their own in order to become more confident to perform also in front of their classmates. They can practice in an environment without judgment, but in this environment students are also expected to present what they have learned. It is not easy to build up a ''presenting culture'' in class, but once it is there, it is no problem at all, even for new students.

6 *Students never perform better than the teacher expects them to do*.

There is considerable evidence showing teachers' expectations are always met. The classic example is the so-called Pygmalion effect (Rosenthal & Jacobson, 1968), a phenomenon in which the greater the expectation placed on people the better they perform.

7 *Initial thinking is the student's responsibility.*

When a student has been struggling for a while with a specific problem the effect of instruction (whether this comes from another student, the teacher, or the program/resource itself) is likely to be much stronger than when the topic is completely new and the student has not been thinking about that. Students should first work with resources other than the teacher.

8 *Talent is always observed after learning has occurred.*

There is much evidence that the impact of "talent" is an overrated one . Achievement requires much time and effort and assuming that talent plays an important role can slow down learning (Bloom 1985; Dweck 2006).

9 *A student can learn anything until (s)he proves otherwise.*

10 *Students are keen on learning. Students who drop out are in fact efficient learners: When they discover they are not learning enough they decide to quit. FC-Sprint² is aiming at a higher efficiency in learning, not for financial reasons but because efficiency is needed for learning itself. If students get the idea that they do not learn, many of them will lose interest and motivation.*

11 *Motivation is the result of a successful process of learning,*

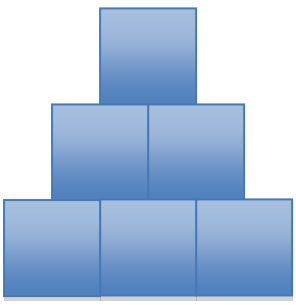
6.3 THE RESOURCES (MATERIALS)

In a FC-Sprint² approach, students are not given the materials (resources) that they should use at a particular moment in the learning process. Rather, all the material is provided at once. They will discover at the start which resources they can use to reach the particular target set by the teacher. In FC-Sprint2, we hope and aim for students to "negotiate" about the targets set by the teacher, or that they come up with what they themselves want to learn. In this view a teacher is the guardian of the student's education. If a student comes up with a target himself, then a teacher has to think if this is an appropriate target. If it is appropriate the teacher defines a target based on the students input. This should be a high expectation.

Tasks are not organized linearly or logically for students. However, the resources are layered, and when it comes to digital resources, these are structured such that a student can dig deeper to find more information. For example, when a student needs to know how a word sounds she/he can hit a button to hear it. When the student does not know the meaning of a word, she/he can hover over a button (or the word itself) to see what it means. The material is not made for a specific student at a specific moment in the learning process. The drop-and-drag exercises, for instance, can be used to write complete words or write individual letters (or combine the two). During that process a student will also learn what the words mean.

Learning materials are built in such a way that there is a top layer and information underneath, which a student can access if she/needs it. This is represented below in two figures, first the hierarchical (layered) way in FC-Sprint², and then the linear way in traditional materials.

This:



and not this:

The idea behind using the former learning material is that the student is in charge and is not led by the computer. (S)he can start where (s)he wants. There is no fixed “route” in any of the programs (and thus no instruction) or a required sequence in the exercises. However, there is immediate feedback so that a student does not have to repeat mistakes only to find out at the end (with a “check the answers” button) that (s)he has made mistakes. Such “check the answers” buttons at the end constitute a test and not an effective learning exercise.

Interestingly, students develop strategies to work with the material. In the drag and drop exercises students first start with the first empty square and go on to the last. Students have been observed who eventually found one right sound, then tried to find similar sounds and filled these squares.[9] After having completed all squares , they tried it again to make fewer mistakes. And after they had filled in all the squares they trained themselves to read the letters and create a word and then checked the sound to see if it was correct.

Although students can work with the material individually, if they get stuck the idea is to ask for help from other students, i.e. their resources. Getting stuck is a positive feature when it results in teamwork.

[9] Jan Deutekom, p.c.

7 THE DIGLIN PROJECT: PEDAGOGICAL APPROACH AND GENERAL CRITERIA FOR SELECTING EXERCISES AND WORDS

7.1 READING PEDAGOGY

The underlying pedagogy for the system of FC-Sprint² and the one to be used in DigLIn is in fact a structure and phonics-based method, in which the primary aim is grasping the structure of the spelling system of a particular language, i.e. associating specific sounds (phonemes) with specific letters (graphemes). This is done on the basis of a whole word which is visually and auditorily structured in smaller units (analysis). Traditionally, this was done with a sheet of paper (see the figure below) and the voice of the teacher that clearly showed the sublexical structure of a word (the analysis) and supported the blending of the sounds into a words (synthesis).

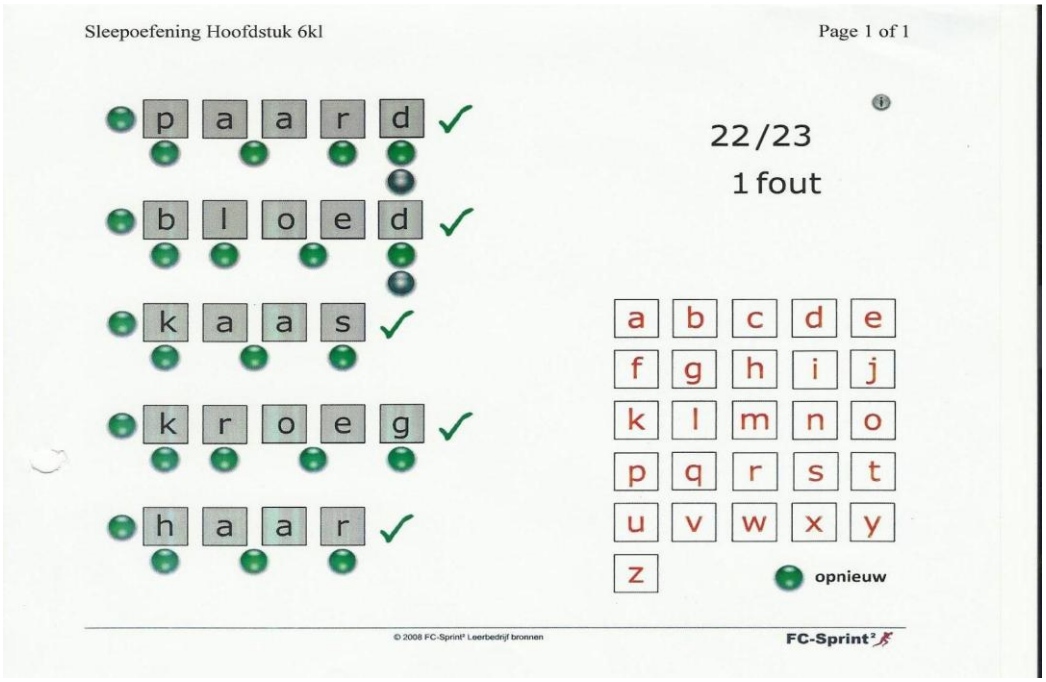
Nieuwe woorden lezen met de structureerblaadjes

Analysis of the word **mus** *('sparrow') by means of structuring sheets – sheets on which a word is marked and can be folded such that the structure of the word becomes clear to the learner through taking off or adding a letter.*

Synthesis/blending of the phonemes for **kus** *('kiss')*

(F.B. Caesar: Veilig leren lezen)

In a computer-aided system like FC-Sprint2 and DigLIn these processes are taken over by the visual and auditory form of the exercises shown in the next figure. The visual form shows a written word as a composite unit of separate elements and the green dots below each square can be activated and can sound out the specific vowel or consonant. In this way both the visual and the auditory composite character of the word can be realized as often as needed for developing the systematic nature of letter-sound associations. Not only analysis of the word is taken over by the computer program, also the synthesis of the sounds into a word is taken over to a certain extent. That is to say, a learner can understand what is the result of the synthesis (the entire word in spoken form by the green button to the left), but is not challenged to read it aloud and getting feedback. This is where the automatic speech recognition (ASR) will come into play by providing an assessment about the read word, in which pronunciation plays a role as well.



Analysis and synthesis in the computer-based material of FC-Sprint[2].The above figure shows how letters from the alphabet can be dragged to the grey blocks on the left. The word to be formed can be heard by clicking on the green button on the left of the word. The green button below a grey square reads out the specific sound [a digraph is represented by one green button between the two graphemes, e.g, between <a> and <a> in <kaas>, or <o> and <e> in <kroeg>].

The basis of the structure method is a restricted number of concrete basic words the meaning of which is clear. In classes of 6- and 7-year-old children, those basic words are presented in a context of a story or a picture story and learnt by heart. In the DigLIn project the meaning of the basic words will be made clear by hovering over a button and showing the meaning. That is why such words must be concrete words or words that can be visually represented.

In the structure method, basic words should also have a one-to-one grapheme-phoneme correspondence (at least at the start), that is to say, the sounds are not influenced in their pronunciation by preceding or following sounds or by the fact that they are in word-final or syllable-final position, as is the case for Dutch. Words with pure sounds are

for English: *dad*, *map*, *door*, *mop*, *jump*, *bin*, *big*, *yes*

for Dutch: *mat*, *kap*, *kip*, *voet* … (and not: *bed* which is pronounced voiceless: /bet/)

for German: *rat*, *hut*, *oma*

for Finnish: *eno*, *iso*, *akka*

Many languages have too few graphemes for the repertoire of phonemes, which is the case for Dutch, but more particularly for English with the same grapheme representing different phonemes. In a phonics approach it is important not to overload the student with the sound written in different ways (represented by different graphemes). A first selection to start with should be made before alternatives graphemes will appear.

Contrary to the learner-independent set-up and the lack of instructions in FC-Sprint², there will be a restricted set of spoken instructions and/or instructional video clips for each exercise template, to make sure that the student can work independently with the program, without the support of classmates and/or a teacher.

7.2 SELECTION OF EXERCICES

The selection of exercises will be determined by components of the reading process, in such a way that all phases of the reading process – auditory and visual analysis and synthesis, acquisition of the phoneme-grapheme correspondence and reading aloud – will be part of the system.

7.3 SELECTION OF WORDS

In the phonics method, the choice of basic words is primarily determined by their usefulness for literacy instruction. Relevance of the word for adult immigrants and frequency of the chosen word are of secondary importance when the structure method is adopted.

So it is preferred to start with:

1) CV(C) words
2) Pure sound words (in which the phonemes are not influenced in their pronunciation by preceding or following phonemes)
3) Maximal difference: first cardinal vowels: /i/, /u/, /a/ occurring in most languages of the target group of learners (so, not /Y/), followed in the same syllable by consonants that are maximally different on the basis of other features (voiceless plosives and nasals).
4) No minimal consonant pairs in one word or series of words for reasons of auditory similarity (not: <pak> and <bak>) or visual similarity (not: <dak> and <bak>).

For the selection of words we take into account complexity and the fact that these words target adult Low-educated Second Language and Literacy (LESLLA) readers. They are students who are still at an early stage of reading, e.g. the glance and guess stage. Because preferably photographs, but also pictures will be used for depicting meaning, words will be concrete content words. It might be evident that frequency should be applied, but this should be done with caution since many frequent words are function words that cannot be represented by images and that may not yet have been acquired by these students. Moreover, the frequency lists commonly used are of less importance because they are not based on what low-literate immigrant adults are likely to encounter. Systematic stress variation in polysyllabic words will also be taken into account. Together with the criteria for usefulness for literacy instruction we arrive at the following criteria for building up complexity.

And proceed with:

5) Vowels and consonants from maximally different (<aa>-<oe>-<ie>) to minimally different (<ie>-<ee> or <a>-<aa>) and from very common in other languages to language-specific sounds (e.g. for Dutch <ui> in <huis> *('*house'*)*.
6) From CVC to CCVC or CVCC and more extensive consonant clusters
7) From monosyllabic to disyllabic to polysyllabic words
8) From concrete to abstract words

9) From noun to adjective to verb
10) From pure sound to spelling convention (e.g., in Dutch for open and closed syllables: *raam-ramen*)
11) From word to small sentence.

Of course, these criteria can come into competition with each other and also the word structure of a language may cause problems, as is the case for Finnish which may use few monosyllabic words because of the complex case system creating a great number of polysyllabic words.

What we aim for in the DigLIn project is optimalizing the system of FC-Sprint2 by adding feedback possibilities to the already existing system of FC-Sprint2 and by making the system suitable to four different languages with orthographies in varying degrees of transparency and to various contexts of literacy education in the four countries.

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