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The Utility of Orthographic Design for Different Users: The Case of the Approved Dagbani Orthography

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This paper presents a critical assessment of the utility of the orthography of Dagbani (a Gur language of Ghana) in the documentation, linguistic research, and literacy acquisition of Dagbani. While written literature on Dagbani dates to over a century, it was only in 1997 that the only known documented orthographic rules of the language, the Approved Dagbani Orthography (ADO), was put together. Its stated goal was to address inconsistencies that existed in the orthographic rules at the time. It has since largely served this goal and has remained a resource for linguists engaged in language documentation and linguistic research as well as adult and young learners acquiring literacy in Dagbani in formal and informal settings. The paper discusses the influence of the orthography in the understanding of aspects of Dagbani linguistics and the challenges that remain with its use in modern-day multimodal communication. It shows that while the ADO has impacted literacy, documentation, and research on Dagbani linguistics, aspects of the design of the orthography have limited its potential impact and have given room for the emergence or maintenance of co-orthographic practices used for electronic communication and in the documentation of names in non-native official circles.

1. Introduction In the development of a language, orthography plays a vital role. In addition to the central role it plays in documentation, it is at the center of literacy acquisition. In many countries where the national language of literacy may differ from native languages, developing an orthography may help in literacy acquisition of two user categories: those who have acquired literacy in the national language and need the orthography to achieve literacy in a second nondominant or heritage language, and those without any formal education for whom the use of orthography is their first attempt at acquiring literacy. Documented rules of orthography also often serve as one of the first documents that introduce an understudied language to non-native speakers conducting fieldwork on the language as well as a principal document for literacy acquisition. This paper presents a critical review of the only orthography ever documented for Dagbani, highlighting the challenges of designing an orthography that meets the needs of linguists engaged in documentation and linguistic analysis and of native speakers acquiring functional literacy in their language.

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Written literature in Dagbani dates to over a century ago.[1] However, the language lacked a written document on orthographic rules until 1997, when a group of sixteen linguists known as the Dagbani Orthography Committee (DOC) put together the first ever documented orthographic rules on Dagbani called the Approved Dagbani Orthography (ADO) (DOC 1998). Like all other Ghanaian languages, Dagbani orthography makes use of the Latin script, a choice based on the influence of English as a colonial language and the official language of Ghana. As will be noted below, the influence of English goes beyond the choice of script. Over the decades, the orthography of Dagbani, including the ADO, has always contained a significant influence from English orthography. This paper will highlight other challenges the DOC must have dealt with in the course of designing the ADO, including historical precedents and traditions prevalent in the language and other languages that use the same script (see Karan 2014 for a detailed discussion on the factors that complicate orthography design).

The ADO was the outcome of efforts to address challenges prevalent in the existing rules for writing the language and ensure uniformity in the use of orthography by all users. It was also intended to standardize all the different undocumented writing conventions existing at the time. In addition to having been adopted by some scholars, notably Knut Olawsky, who was a member and convener of the Committee and used the rules in his thesis on Dagbani (Olawsky 1999), the rules set out in the ADO have been used by Dagbani lecturers and graduates in the University of Education, Winneba (UEW) to teach Dagbani, develop teaching and learning materials, and translate documents from other languages into Dagbani. Naden (2014), a Dagbani dictionary, also used the rules of the ADO in the spelling of words in the dictionary and makes several explicit references to them.

Its use by scholars in the UEW is significant because UEW is the highest institution engaged in the training of teachers of Dagbani and has produced thousands of students since the ADO was designed. Graduates from the Dagbani language and culture program of UEW teach Dagbani as a subject in basic and secondary schools in Ghana, among other career paths that make use of their knowledge of Dagbani language and culture. The rules prescribed in the ADO are part of the Dagbani literacy course taught to students in basic and secondary schools. Students who write their basic- and secondary-school terminal exams in Dagbani administered by the West African Examinations Council are expected to apply them in demonstrating their proficiency in Dagbani literacy.

In spite of its influence, the ADO still has limitations and challenges. Native Dagomba literates with interest in acquiring functional literacy in Dagbani (especially in nonformal settings) for everyday communication encounter significant challenges relating to the accessibility of some of the characters that are part of the letters of the orthography on standard electronic keyboards. While some of the prescriptions are influenced by English orthography, others depart from it in

[1] For example, Fisch's 1913 Dagbani–German wordlist, cited in Blench (2004). See Blench (2004) and Olawsky (1999) for a detailed bibliography of literature written in Dagbani dating back to the early part of the twentieth century.

ways that are not consistent. This hinders a successful transfer of knowledge of English orthography to learning Dagbani. Some of the rules in the ADO have not been accepted by all Dagbani scholars. Some writers have not adopted some of the changes introduced in the ADO and have stuck to the conventions predating the ADO. Others deem some of the proposals unscientific or inconsistent with the grammar of Dagbani in some respects.

The Dagomba are highly motivated to gain literacy in Dagbani (cf. *Principle of Maximum Motivation* in Smalley 1964). For literate speakers[2] in particular, literacy in Dagbani gives them a stronger connection to their cultural heritage and is a source of pride in their ethnic origin. With the advent of social media, both literate and non-literate Dagomba see the exchange of information through the Internet in Dagbani as an integral part of their cultural identity. The Dagomba who live in the diaspora have a greater interest in literacy in the language. With it, they and their children are able to read classical books written in Dagbani on various aspects of Dagbani history and culture, as they lack access to the media and to more elderly relatives who are the traditional source of such information.

This review elaborates on the successes, strengths, and limitations of the ADO. In doing so, it provides a further understanding of the orthographic rules contained in the ADO under the lenses of cross-linguistically noted principles and factors that influence the design of orthographies. It also highlights the challenges with acquiring literacy in Dagbani posed by some of the orthographic rules as well as the influence of the orthographic rules on the research, teaching, and learning of Dagbani linguistics at the tertiary level. Many of the challenges noted (especially those relating to the mismatch between the orthography and the phonology and morphosyntax) are not unique to Dagbani. Languages with centuries-old orthographies such as English may present much bigger challenges. However, the fact that the ADO is a recently designed orthography presented an opportunity to reduce these mismatches to the barest minimum to enhance its learnability and facilitate functional literacy acquisition.

1.1 Background on Dagbani Dagbani is a Gur language spoken in the north of Ghana. It is the dominant language in the administrative Northern Region of Ghana. It is one of a handful of Ghanaian languages with a quasi-national status, as it is used in the media at both the national and regional levels, serves as a medium of instruction in lower basic school, and taught as a subject in basic, secondary, and tertiary institutions. The language has over a million native speakers, many of whom use it as their only language. The native speakers belong to two ethnic groups who share a common ancestor and cultural heritage: the Dagomba and Nanumba. It is also widely spoken by the Mamprusi, the third of three ethnic cousins with a common heritage, whose language is relatively mutually intelligible to native Dagbani speakers. Dagbani is also a second language to many speakers of most languages

[2] The use of "literate speakers" in this paper refers solely to speakers who can read and write the English language. There are some others who are literate in other languages (especially Arabic) but not in English. Their literacy is not of any relevance to the issues discussed in this paper.

spoken in the north and other parts of Ghana who live in Tamale (the cosmopolitan city and capital of the Northern Region), Yendi (the traditional capital and seat of the Yaa Naa, the king of the Dagomba Kingdom), Bimbilla (the traditional capital and seat of the king of the Nanumba Kingdom), and many other towns and villages in the Northern Region. Thus, the language enjoys active use and is far from being endangered.

1.2 The desire for functional literacy in Dagbani among speakers Regarding literacy in Dagbani, one issue that stands out in my interaction with highly literate Dagomba, especially those who live in the diaspora, is the general feeling that a high level of literacy in Dagbani requires the devotion of a significant amount of time to learning. To some extent, they see it as a specialized knowledge that is out of the reach of the ordinary Dagomba who does not have the time to invest in learning it. In other words, Dagbani literacy is perceived to be exotic knowledge that cannot be attained by transferring one's knowledge of English, even though both languages use the Latin script.

Between 2007 and 2008, ten years after the ADO was designed, one online community of Dagomba called D-Net, encouraged members to use Dagbani in their online e-mail interactions as a means of helping members strengthen their literacy in the language. Through that, those with minimal or no literacy in Dagbani could learn from those who were highly proficient. One problem they faced in following through with this initiative was the nonavailability of some of the letters of the Dagbani orthography on standard QWERTY computer keyboards. In the process, an alternative to each of the IPA symbols in the orthography was suggested and circulated (e.g., <ng> for <ŋ>, <e, o> for <ɛ, ɔ respectively). However, this was not welcomed by all, and the initiative eventually failed. While keyboards with IPA symbols now exist even for communication on handheld devices like cellular phones, many users who type in Dagbani appear to be accustomed to limiting themselves to the letters of the English orthography, as they continue to avoid the IPA symbols and prefer using the symbols on standard keyboards for typing Dagbani texts in everyday communication, especially on social media. This, among other challenges noted below, accounts for the failure of many literate speakers to make use of the prescriptions of the ADO in their daily communications.

The rest of the paper is organized as follows: Section 2 provides further details on the design of the ADO, including its scope and the classification of the design. Section 3 reviews the rules of the ADO, including the letters and rules reflecting the implementation of morphological and phonological processes in the language. Section 4 discusses the effects of some of the rules on the teaching of Dagbani linguistics. Section 5 looks at the effects of the nontesting and publication of the ADO, while Section 6 presents the concluding remarks.

2. The design of the Approved Dagbani Orthography

2.1 Scope The ADO is a bilingual document. Each rule is written in English and translated into Dagbani. The rules and prescriptions cover the letters of the orthography, as well as rules on the orthographic implementation of some morphological

and phonological processes in Dagbani, such as vowel insertion, palatalization, the use of the advanced and retracted variants of vowels, and nasal assimilation. There are also guidelines regulating the representation of particles such as the focus markers la, mi; the conjunctions ni, mini; and the verbal particles such as ni, na. The ADO also includes loan translation of some terminologies and names of some grammatical units that needed to be standardized.

The vowels and consonants that constitute the letters of the ADO are shown in (1). The phonological sounds these letters represent are shown in (2) and (3). The sounds shown are the phonemes, notable allophones in "[ ]", and letters of the orthography in "< >". The phonological sound inventory displayed here is based on Hudu (2018) and Hudu & Nindow (2020).

(1) Letters of the ADO

a. Consonants

Singletons: <b d f g h j k l m n p r s t v w y z ʒ ɣ ŋ>

Digraphs: <ch gb kp sh ny ŋm>

b. Vowels

Short: <i u e o a ɛ ɔ>

Long: <ii uu ee oo aa>

(2) Consonant sounds represented by letters of the ADO

	Labial	Alveolar	(Pre-) Palatal	Labial-velar	Velar	Glottal
Stop/ Affricate	p <p> b <b>	t <t> d <d>	ʧ <ch> ʤ <j>	kp <kp> gb <gb>	k <k> g <g>	[ʔ] <ɣ>
Fricative	f <f> v <v>	s <s> z <z>	[ʃ] <sh> [ʒ] <ʒ>			[h] <h>
Nasal	m <m>	n <n>	ɲ <ny>	ŋm <ŋm>	ŋ <ŋ>	
Liquid		l <l> [ɾ] <r>				
Glide			j <y>	w <w>		

(3) Vowels represented by letters of the ADO

Short vowels			Long vowels	
i <i>	ɨ <i>	[u] <u> ʊ <u>	i: <ii>	u: <uu>
[e] <e>		[o] <o>	e: <ee>	o: <oo>
ɛ < ɛ>		ɔ <ɔ>		
	ʌ <a>			
	a <a>			a: <aa>

2.2 Type of orthography Prior to the design of the ADO, linguists engaged in the teaching and research of Dagbani had a strong desire for a unified orthography. In a preface to the ADO, the DOC is explicit about the main motivation for designing the orthographic rules: It was aimed at addressing the inconsistencies that existed in the different writing conventions existing at the time. By coming out with a document spelling out the orthographic rules of the language, the ADO has largely achieved that goal. For native speakers who are not linguists, there is hardly any awareness that prior to 1997, there were different writing conventions and that these differences were harmonized into one document called the ADO (see Section 5 for further discussion on awareness of the ADO beyond Dagomba linguists).

What the DOC was not explicit about is the type of orthography they set out to design. However, it is evident that the ADO was designed to be a permanent orthography, not a transitional orthography (e.g., Venezky 1970; Sebba 2007). As already noted, literary material written in Dagbani existed several decades before the design of the ADO, so it could not have been anything but a permanent orthography. What is not evident is the question of who the intended beneficiaries are, as the design presents conflicting indications that make it difficult to reach definitive conclusions. The ADO has elements of a practical orthography providing orthographic guidelines for all categories of users. This includes its bilingual character. In addition to linguists conducting research on the language, the ADO should be accessible to learners of Dagbani language, literature, and culture from basic to tertiary levels of education. It should also be accessible to literate speakers of the language interested in learning to read and write the language, as well as translators, writers of Dagbani literary materials, and developers of teaching and learning materials in Dagbani. It is worth noting that at the time the ADO was designed, and even presently, there were many Dagomba who were literate in Dagbani but not English. These are products of a national functional literacy program that was instituted in the 1990s. Designing the document as a bilingual one makes it accessible to all Dagomba monolingual literates. Another feature that brings it closer to a practical orthography is the style of presentation of the rules. The rules are presented in simple and nontechnical language that can be easily understood by all users, regardless of their level of

education, though the DOC did not appear to be very consistent in this regard, as discussed later in this paper.

Other aspects of the design make the orthography more technical. They suggest that the DOC had a greater focus on reconciling the differences that existed in the writing system to make it suitable for linguists working on Dagbani than addressing the difficulties that learners of Dagbani might face in acquiring Dagbani literacy. This analysis is based on observations by Venezky (1970) on the design of a practical orthography, who notes that it should be based upon three considerations: (i) the intended function of the orthography, (ii) the process of acquiring literacy, and (iii) the structure of the language it is to reflect. Aspects of the ADO that make it more technical than practical are the inclusion of IPA symbols and the inconsistencies in the adoption of English orthographic rules. The overwhelming majority of leaners of Dagbani orthography, regardless of age, come to this task with full or partial literacy in English. The inconsistencies in the correspondence between English letters and the letters of the ADO, as elaborated further in this paper, present a significant challenge to these learners.

3 Review of the design of the ADO This section provides a review of many of the rules and prescriptions of the ADO, including the letters, and rules reflecting phonological and morphological processes in Dagbani.

3.1 Letters of the ADO in light of principles of orthography design When Smalley's 1964 principles of *Maximum Motivation*, *Maximum Transfer*, and *Maximum Ease of Reproduction* for the design of orthography are applied, it appears that the DOC's work addressed the linguists' desire for a uniform orthography rather than the learners' desire for an orthography with fewer complications for reading and writing. The presence of IPA symbols offends the principles of *Maximum Transfer, Ease of Learning,* and *Ease of Reproduction*. It deprives the matured learner the opportunity to easily transfer knowledge of English orthography into Dagbani. It deprives the young learner the chance to easily apply the rules of English orthography that are being learned to Dagbani.

One of the classical principles for designing orthographies, and for making them suitable for all categories of users, is the *one symbol per phoneme* principle (Pike 1947; Gudschinsky 1953; Nida 1954), which advocated a one-to-one correspondence between the symbols representing the orthographic sound units and the phonemes of the language, with some modifications where desirable. The application of this principle in the design of the ADO would have constituted a radical departure from the conventions that preceded it. For vowels, it would require the selection of only one out of each of the allophonic pairs [u, ʊ], [e, ɛ], [o, ɔ], and [a, ʌ] as a letter of the orthography. It would also require the inclusion of <ɨ> as a distinct letter from <i>, given that [ɨ] is distinct from the other high vowels (cf. [pɨ̀lɨ̀] 'cover,' [pʊ̀lɨ̀] 'seek assistance from a deity,' and [pìlɨ̀] 'start').

The inclusion of seven short vowels, instead of six, and the specific vowels included cast doubt on whether the *one symbol per phoneme* principle was ever considered in deciding which vowel letters to include. For the low vowels, only [a] was

known to occur in Dagbani at the time the ADO was designed. The understanding that /a/ has an advanced variant came in detailed phonological and ultrasound phonetic studies more than a decade later (Hudu 2010; 2014b). Among the high vowels, only [u] and [i] were included. The DOC did not see the need for <ɨ>, representing it in the orthography as <i>. This exclusion of [ɨ] seems welcomed by speakers, as it is not difficult to determine from context, whether the letter <i> should be pronounced as [i] or [ɨ]. Thus, it does not violate the *Readability Principle* (Nunn 1998), which permits spelling to deviate from the pronunciation in contexts where the right pronunciation can be derived. More importantly, it saves the learner the task of learning an unfamiliar vowel symbol and searching for it when writing on an electronic device.

However, these reasons also provide more compelling grounds for the exclusion of <ɛ> and <ɔ>. Unlike [ɨ], no ambiguity ever arises in the use of <o> and <e> in contexts where the vowels [ɔ] and [ɛ] surface. A further complication is that, the rules require the vocalic digraph <iɛ> in cases where palatalization is apparently perceived to be strong, even though the list of vowel letters does not include a digraph. The inclusion of four short mid vowels in a phonology with only two as contrastive, and two high vowels in a phonology with three as contrastive suggests that the *one symbol per phoneme* principle was not considered, let alone adhered to. In Cahill & Karan's 2008 expression of the correspondence between letters and phonemes, it constitutes both over-representation of letters when compared with the number of mid-vowel phonemes and under-representation for high vowels.

This apparent disregard for the *one symbol per phoneme* principle manifesting as over-representation is more obvious in the choice of consonants as letters of the orthography, as the only five non-contrastive consonants that surface in all dialects of Dagbani [ʃ, ʒ, ɾ, ʔ, h] are included as consonant letters. The predictability of these consonants is well noted in the literature (e.g., Olawsky 1999; Hudu 2010). The postalveolar [ʃ] <sh> and [ʒ] <ʒ> are respective surface variants of /s, z/ before front vowels; [ɾ] <r> is a result of post-vocalic flapping of /d/, while [ʔ] <ɣ> and [h] <h> are respective variants of velar plosives (/k, g/) and the alveolar fricative /s/ after short vowels. The inclusion of most of these sounds as letters seem justified from the native speaker's perspective. From my experience in teaching Dagbani during the past decade, university students appear to be very naive about most of these allophonic variations. It takes a detailed explanation for them to understand that the corresponding sounds to these letters are not contrastive in Dagbani. The only exception is [ʔ] <ɣ>, which is easy to illustrate using place names that are spelled mostly with <g> due to the lack of <ɣ> in the English orthography, (e.g., <Gushegu> for <Gushɛɣu>). This aligns with Cahill & Karan's 2008 observation that the native speakers' perception should be a greater consideration in designing an orthography than the linguists' knowledge of the phonology.

Commenting on the inclusion of the four mid vowels, Blench (2004) observes the lack of phonological motivation but ease of implementation, noting that "[p]reliminary rules from the currently-sitting orthography committee suggest that their proposals, while linguistically unmotivated, will be largely such as will be possible to implement automatically" (Blench 2004: 3). He particularly describes the inclusion

of [ɛ, ɔ] and [ɣ] as unnecessary but concedes that their inclusion will be sustained as a mark of tradition. All these letters have been part of the orthography of Dagbani, and the DOC must have felt that there is a greater need to maintain them based on speakers' familiarity with them than change them to achieve a phonologically motivated representation. In fact, the need to stick to history and tradition may have included the histories of orthographic design of other Ghanaian languages. As Blench (2004) notes, the design of orthography for many Ghanaian languages was influenced by the orthography of Akan, a dominant language in Ghana and one of the early Ghanaian languages to receive attention in language research and documentation. The effect of that influence is such that these languages were assigned seven vowel letters, consisting of the English vowels <a, e, o, i, u> and the mid vowels /ɛ/ and /ɔ/. This was done regardless of the phonemic vowel inventory of the language.

What is obvious in the design of the vowels and consonants is the violation of what Winer (1990) calls the *Principle of Consistency*. In addition to the lack of consistency in the representation of noncontrastive sounds, as already noted, the DOC was also inconsistent in the use of phonetic symbols. To achieve its goal of standardizing the orthography and making writing in Dagbani easier, the DOC dropped some phonetic symbols that had been used by some writers. Notable among these are the symbols <c>, <ʦ>, <ʣ>, <ʧ>, and <ʤ>, which were all used to represent affricates. The DOC decided that the two affricates should be represented by the more familiar symbols <ch> and <j>, which were also in use along with those that were dropped. This choice was likely influenced by the use of these letters for the same sounds in English and is one that is easy for literate native speakers acquiring Dagbani literacy.

However, this apparent effort did not go far enough, as the DOC maintained <ɣ, ʒ, ŋ> as letters of the orthography. The needlessness of the use of <ɣ> as a postvocalic variant of <g> has already been noted in the preceding paragraphs, a view that is also held by Blench (2004). For <ʒ>, which is less intuitive to native speakers as a variant of /z/, the use of an IPA symbol could easily have been avoided in favor of the digraph <zh>. This is a digraph that has never been part of the Dagbani orthography but would be consistent with the representation of [ʃ], the voiceless counterpart of [ʒ], as <sh>. The decision not to include this alternative suggests that the DOC did not consider the need for consistency, if doing so would result in the introduction of markedly new proposals. Similarly, while the speculation that the use of <ch> and <sh> may have been influenced by their presence in English to represent the same sounds to look plausible, it is inconsistent with the DOC's decision not to use English orthography as the basis for representing the velar nasal /ŋ/, which is represented as <ng> in English.

One reason that makes <ng> less attractive in Dagbani compared to English is the distribution of /ŋ/, which may surface word-initially, in word-internal onset and coda positions, and in word-final positions. Thus, a word like the demonstrative <ŋo> 'this' would be spelled as <ngo>. Given the existence of many particles and clitics that surface as [n] (e.g., first-person singular pronominal, first-person possessive, infinitive marker, focus marker, the cardinal prefix), the nasal in <ng> could be interpreted by learners as one of these particles when <ng> is in word-initial position. For instance, the word <ŋo>, when spelled as <ngo>, will be phonologically identical

with the phrase [ŋ gɔ] 'to travel' though orthographically different with a hyphen between the infinitive marker and the verb: <n-go>. It would also constitute the only case of word-initial sequence of nasal and oral consonant in Dagbani orthography. However, such ambiguities are unlikely to be stronger than the ambiguities arising out of the use of the letter <i> for both /i/ and /ɨ/ and are only likely among learners of Dagbani literacy in the early stages of learning before they understand the link between the digraph <ng> and the sound [ŋ]. Such ambiguities would also be much fewer and weaker than ambiguities posed by tone, which is unmarked in the orthography. What is more, such ambiguities would be non-existent in word-final positions, where, phonotactically, only [m] and [ŋ] surface. Thus, representing word-final <ŋ> as <ng> or even <n> would not give rise to any challenge to learners. Indeed, the names of the two kingdoms of the speakers of Dagbani are spelled in official, non-native circles as Dagbon (for <Dagbɔŋ>) and Nanun (for <Nanuŋ>).

A greater complication arises in the labial velar nasal <ŋm> [ŋm]. Representing <ŋ> as <ng> would suggest that [ŋm] be represented as the trigraph <ngm>. However, alternatives to the trigraph are the digraphs <gm> and <nw>, both of which preserve the [labial], [dorsal], and [nasal] feature specifications inherent in [ŋm]. Interestingly, these alternative digraphs (<ng>, <nw>, and <gm>) are all used by literate native speakers in online and other electronic platforms and in the official spelling of words of Dagbon (the kingdom of the Dagomba) and Nanun (the kingdom of the Nanumba) origin when English orthography is used. For instance, a village called <Ŋaani> [ŋaːnɨ] is officially spelled as <Ngaani>, while [ŋɔɣu] and [ŋɔdua], also village names, are spelled as <Nwogu> and <Nwodua>, respectively. The choice between <ng> and <nw> appears to be based on the rounding of the vowel following the underlying [ŋ], with <nw> being the choice when a round vowel follows. Similarly, <Ŋmantambo> [ŋmantambo], the name of a great ancestor of the Nanumba, is spelled as <gmantambo>. The fact that these spelling conventions predated the ADO and are bound to remain presented an opportunity to the DOC to make proposals that would harmonize Dagbani orthography with these conventions and eliminate or minimize differences in the spelling of proper names in Dagbon and Nanun, in addition to the benefit of easy transfer for learners familiar with English orthography. Evidently, the quest for orthographic rules that are distinctive overrode the need for such harmonization even if it was ever considered. The negative effect is such that the lack of such a harmonization contributed to the exoticization of the orthography and the continuous existence of dual orthographic conventions.

3.2 Rules of the ADO reflecting sound changes and alternations One of the key strengths of the ADO is the inclusion of rules that reflect observed sound changes in Dagbani phonology. These include vowel insertion, homorganic nasal assimilation, and the alternation between advanced and unadvanced mid vowels in different contexts. The rules on vowel insertion prescribe the nonfinal contexts where insertion is permitted and the quality of the epenthetic vowel. In Dagbani phonology, the nonfinal coda consonants are the nasals and [b, l, ʔ, ɾ]. The ADO prescribes the insertion of the vowel [i] after these oral consonants in nonfinal position (along with <s, h> in other contexts) but no such insertion after the nasals. These rules, while treating

the nasals and the oral sounds differently, is grounded in the phonology of Dagbani. They show nasals as the only coda consonants that are permitted non-finally. The fact that the rule stipulates insertion after these oral sounds implies, rightly, that the vowel is not underlying. The ADO is explicit that the epenthetic vowel in Dagbani is [ɨ], which is represented orthographically as [i]. This is consistent with previous studies of Dagbani phonology, which show that the default, epenthetic vowel is [ɨ], which surfaces as [i] when subject to the rules of advanced tongue-root ([ATR]) harmony (e.g., Hudu 2010; 2013; 2018). What is not consistent with Dagbani phonology is the prescription on the use of <iɛ> in place of <ɛ> after palatalized consonants. In addition to lack of phonetic or phonological basis for this rule, as discussed further in Section 4, the rule is not expressed as a case of vowel insertion, neither is <iɛ> listed as a digraph in the language.

On nasal place assimilation, the ADO restricts changes in the place specifications of nasals to contexts that produce surface [m] and [n], even though, phonetically and phonologically, any of the nasals attested in Dagbani (and even [ɱ]) may surface as a product of nasal place assimilation (see Hudu 2014a for extensive discussion). In contexts where assimilation to consonants of other place specifications will produce surface [ŋ, ɲ, ŋm], the ADO insists that the underlying place of the nasal be maintained. Whether intended or not, the rules on NPA have the effect of minimizing the occurrence of surface [ŋ] in Dagbani orthography.

With few exceptions, the rules on the use of advanced and non-advanced mid vowels are also phonologically grounded. The back vowel <ɔ> is prescribed to surface mainly in nonfinal positions before the consonants <ŋ, n, r, b, d, ɣ, h>. The [+ATR] variant [o], on the other hand is prescribed for word-final positions, with few exceptions where it surfaces in nonfinal positions. For the front pair, [e] is prescribed for word-final position, again with few exceptions. These rules are largely consistent with the phonetics and phonology of Dagbani mid vowels and the rules of ATR harmony in the language (Dakubu 1997; Hudu 2010; 2013; 2016). A clear exception to this consistency between the phonology and the orthographic rules is the prescription that before any of the consonants <k, l, m> in nonfinal contexts, <o>, and not <ɔ> should surface. In other words, the complimentary distribution between <o> and <ɔ>, which has <ɔ> in nonfinal word positions and <o> in final positions of lexical words does not apply when <k>, <l>, or <m> is the consonant that follows the vowel immediately. This exception, like others that deviate from phonological findings on Dagbani, appears to be driven by the desire to maintain the spelling of some common words that were prevalent at the time (e.g., [kɔm] 'water' as <kom> instead of <kɔm>).

3.3 Rules of the ADO on morphological units The proposals of the ADO on the representation of morphological units may have posed the greatest challenge to the DOC. This is because rules for representing various morphological categories have an implication for defining the word as an orthographic unit, a task that is more difficult than defining the orthographic sound. For such rules to be in harmony with the grammar of the language, the morphosyntactic structure and, to some extent, the morphophonological patterns of the language would have to be considered.

The ADO rules on morphology suggest that conforming to Dagbani morphosyntax and morphophonology was not the goal. While bound morphemes such as nominal suffixes and aspectual markers are consistently captured as part of their roots and stems, some particles and clitics received inconsistent treatment.

The negative marker and the third-person plural marker are homophonous, pronounced as [bɨ]. However, the pronominal clitic is spelled as <bɛ>, while the negative particle is spelled <bi>. By this, the pronoun becomes distinct from the lexical root [bi], which has several lexical meanings, including the state of being well cooked. The choice of [ɛ] to replace the mid-central [ɨ], which is not part of the orthography, is a perfect one. Dagbani mid vowels in lexical word-final positions always surface as advanced [e, o], as already noted. Replacing the central [ɨ] in these particles with <e> would have led to ambiguity with the lexical form [be] <be> 'ugly/bad.' However, the lexical form <bi> remains a homograph to the negative particle. Similarly, other particles such as [dɨ], a third-person singular inanimate marker or a time depth marker, [tɨ] 'first person plural' and the focus particle [mɨ] are all spelled as <di>, <ti>, and <mi>, respectively, making them homographs with the lexical words [di] <di> 'eat,' [ti] <ti> 'give/vomit,' and [mi] <mi> 'know.' The existence of these homographs calls into question the speculation that representing the pronominal marker as <bɛ> may have been intended to distinguish it from other lexical forms. It appears more likely that it was an existing convention that the DOC chose not to change.

A good application of the *Principle of Consistency* is in the morphosyntactic representation of postverbal particles such as *mi, la, ni,* and *na,* each of which is to be written jointly with the verb, behaving as a suffix, unless a noun or some other particle intervenes between the verb and any of them, in which case it is written as a separate unit. However, while the rule is consistent for all the particles, it ignores the grammatical differences between them. For instance, *la* and *mi* are focus markers, which give them a weaker affinity with the verb compared to the locative and directional markers *ni* and *na*. Besides, there is a postnominal homographic demonstrative/determiner *la* that is not attached to the noun. For a learner with little or no knowledge of Dagbani grammar, knowing the difference between these two homographs without explicit instruction may pose a challenge.

4. The influence of the ADO on the teaching and learning of Dagbani linguistics

Tertiary students in Ghana who learn Dagbani are first taught the orthography before they learn the phonetics and phonology of the language, as is the case with many well-developed languages such as English and French. Even before enrolling in the tertiary program, most would have acquired some level of literacy in the language at the basic or secondary levels, where they study Dagbani language and culture as a subject. The course in Dagbani orthography at the university provides them advanced knowledge and gives them greater confidence in their literacy in Dagbani. When they later register for a course in Dagbani phonetics and phonology, the greatest challenge they face is the understanding of the differences between the letters of the orthography and the phonetic and phonological segmental units of the language. While this may not be unique to Dagbani, the near one-to-one correspondence between the letters and the sounds (as shown in (2) and (3)) makes it difficult

to consciously keep the two as separate units. Thus, the presentation of letters as phonological sounds is one of the commonest errors students make when writing an exam on Dagbani phonetics and phonology. These errors could have been minimized if the letters representing the more predictable noncontrastive sounds (e.g., <ɣ, ɔ, ɛ>) were not part of the orthography.

One rule of the ADO with the weakest phonetic or phonological basis is the prescription that <iɛ> replaces <ɛ> when the preceding consonant is palatalized; the list of consonants that are subject to palatalization being <d, p, b, f, v, ʒ>. It is difficult to explain why <d> and <ʒ> get palatalized, but their respective voiceless variants <t> and <ʃ> do not, more so when the list contains two other pairs of voiced and voiceless stops and fricatives <p, b> and <f, v>. These prescriptions are contrary to findings that palatalization (or general coronal articulation) affects all contrastive consonants in Dagbani except /w/ and the inherently palatal /j/ (Ladefoged 1968; Wilson & Bendor-Samuel 1969; Olawsky 1999; Hudu 2010; 2016). Findings from these studies show that the front vowels are responsible for the following alternations, some of which are cases of neutralization of underlying contrasts: /s/→ [ʃ], /z/→ [ʒ], /g/→ [ʤ], /k/→ [ʧ], /ŋ/→[ɲ], /kp/ → [tp], /gb/ → [db], and /ŋm/ → [nm]. The remaining consonants [t, d, p, b, f, v, l, m, n] all get palatalized before front vowels, although they do not produce noticeable surface variants.

At the level of morphosyntax, the ADO has influenced students' understanding of various grammatical units and the nature of the morphophonological processes that take place in Dagbani. For instance, there are several places where the document references the terms prefixes, suffixes, and even morphemes. However, in other places where the rules affect nominal suffixes, the suffixes are treated simply as the final sounds of the words. For instance, Section 1.5.0 of the ADO is titled "[T]he nominal endings <-ia> and <-ua>" when in actual fact, the <a> in both the <-ia> and <-ua> sequences is the singular suffix, while the <i> and <u> are part of the root (e.g., bi-a 'child-SG,' bi-hi 'child-PL,' bu-a 'goat-SG,' bu-hi 'goat-PL') (see Olawsky 1999; Hudu 2005; 2010; 2014a on Dagbani nominal morphology). In addition to not indicating that the "endings" contain suffixes, the caption and explanation of the rule obfuscates the boundary between the nominal root/stem and the suffix. This has implications for the analyses of various morphological and phonological processes in the language. One such process is root compound formation, which brings together the nominal roots of the lexical constituents of the compound and the nominal suffix of the final constituent, as illustrated below (see a detailed discussion in Hudu 2010; 2014a; 2018; Hudu & Nindow 2020).

(4) Compound formation in Dagbani

<piɛɣu>	*<piɛ'lahi>*	*<piɛ'la piɛlli>*	*<piɛ'la piɛl'kara>*
[pɛ-ʔʊ]	pɛ-la-hɨ]	[pɛ-la-pɛl-lɨ]	[pɛ-la-pɛl-kaɾ-a]
sheep-SG	sheep-male-PL	sheep-male-white-SG	sheep-male-white-big-PL
'a sheep'	'rams'	'a white ram'	'big white rams'

While this is a purely a morphological process, the absence of the nominal suffix of the nonfinal constituent of a root compound is treated as elision due to the decision not to recognize them as suffixes. This is captured in Rule 3.1.3 of the ADO thus: "When an adjective follows the noun, it should be written separately. When any part of it is elided, it should be indicated by the elision symbol" (DOC 1998: 34). A similar prescription in Section 1.6.0 titled "word-final vowel elision" says that "Dagbani spelling will allow the final vowel of a word both to be maintained or replaced by an apostrophe. Words that are separate words, should be written separately" (DOC 1998: 28). The examples provided in the document to illustrate this rule all involve the non-inclusion of a nominal suffix consisting of only a vowel.

The DOC may well have had good reasons for describing the process as elision. The ADO was apparently neither designed solely for use by linguists nor meant exclusively as an aid to the grammatical analysis of Dagbani. Thus, there was the need to express the rules in a way that could be understood by all users, including people with no training in linguistics. Describing it as elision may have been intended to make it useful and meet the needs of all users. However, minimally using the word suffix would have been sufficient to achieve the desired descriptive simplicity while providing basic information about the morphology that would enhance the utility of the ADO as a linguistic document. The point of this discussion is to highlight the effect of this presentation on the learning and research on Dagbani linguistics. From my experience teaching Dagbani linguistics, it takes a considerable amount of time for students to unlearn the descriptive details in the ADO.

This negative effect is also observed in the names prescribed for some grammatical units and other terminologies in Dagbani, mainly through loan translations from English. One of such terminologies is the term bachijilli, literally 'word slice' to describe the syllable. Ambiguity with other morphological units such as the morpheme and affix were addressed with different terminologies that either predated the ADO or coined subsequently. While the term bachijilli is a good and intuitive description of what the syllable is, it gives the misleading impression that the syllable, being a portion of the word, is a morphological unit, just as the word is. This misconception has since been a burden for the teacher of Dagbani phonetics and phonology to clear.

5. The lack of testing and official publication before implementation Part of the challenge with the use of Dagbani orthography is that, like that of many Ghanaian languages, the ADO was not tested before its implementation (see, e.g., Powlison 1968; Karan 2014 on the need to test a newly designed orthography). The sixteen linguists who constituted the committee that designed the ADO were probably considered diverse enough to provide sufficient backing to the proposals in the ADO. Most of these members had been working on Dagbani literacy and linguistics for decades. Thus, the committee must have assumed that its combined expertise and experience working on the language was enough to provide the diversity of perspectives required to provide a working document that would eliminate the existing differences and contradictions and gain the acceptance of all.

However, without actually testing it on the population, it is difficult to imagine how the DOC could have come to a determination on the crucial goals of orthography testing, including the ease of learning and the general perception of the user community on the proposals it put together. Given that the DOC made no explicit comments on testing, any comments to that effect will, at best, be speculative. It is not clear if the DOC considered testing it and whether financial constraints may have contributed to its inability to do so.

The lack of testing may also explain the difficulty with making proposals that were radically different from the writing conventions that predated the ADO. As noted by Powlison (1968), an orthography that is in use for a long time gains some level of sanctity among the users, making it difficult to abandon aspects of it. The presence of IPA symbols, for instance, is a common feature of the orthography of every Ghanaian language and has been part of the earliest written documents on Dagbani. It appears that its absence in the ADO could have deprived the ADO of the face validity required to qualify it as an orthography of a Ghanaian language.

Related to lack of testing is the relative obscurity of the ADO. The ADO is very much concentrated in the UEW. A search in several libraries in the University of Ghana in the early 2000s showed that only the library of the Language Centre had a copy. The ADO was neither reviewed nor published by any regulatory authority. Within the community of linguists actively working on Dagbani orthography, such a publication was not required for the rules of the ADO to be accepted. However, the lack of regulatory endorsement and official publication restricted the circulation of the document. This contributed to its relative obscurity and the failure of some users to adopt its rules in their writing of Dagbani.

6. Concluding remarks There is no doubt that the ADO has achieved considerable success in the documentation of Dagbani during the past two decades. In addition to serving its main goal of addressing the inconsistencies that existed in the orthographic rules, it has been used in the writing of thousands of student projects and theses, translation of documents, and the development of textbooks and other teaching and learning materials. In spite of all these successes, its use cannot be said to be universally accepted, due mainly to the lack of consistency in the rules and the retention of linguistically unmotivated rules and structures. Beyond standardizing the orthographic practice of Dagbani, the DOC apparently did not set for itself any lofty goals in the standardization efforts that birthed the ADO.

It may be an overstatement to suggest that the observance of orthographic design principles and compliance with aspects of Dagbani grammar noted in this paper along with testing of the rules, regulatory oversight, and publication of the ADO would have led to a universal acceptance of the rules of the ADO within the two decades of its existence. While cleansing the orthography of IPA symbols would have helped eliminate parallel spelling conventions and, by default, achieved a higher level of acceptance, it is not obvious that the involvement of regulatory bodies would have produced a similar outcome. Blench (2004: 3) alludes to "continuing government-decreed revisions of orthographic practice" in Ghana during the early to middle part of the 1900s. However, that did not address the problem of inconsistency in

Dagbani orthographic rules.[3] The different rules existed for so long, with different writers holding strongly to them, that achieving a universal acceptance within a short time would probably take more than the involvement of regulatory bodies. A definitive conclusion on what the potential effects of these measures could have been will require a comparative study of different orthographic designs that observe these measures.

What we can conclude is that the observation of these measures would have provided a greater awareness about the existence of the ADO as well as facilitated literacy acquisition through the transfer of knowledge of English orthography. It would also have made the ADO a better tool to aid in the teaching, learning, and research of Dagbani. All these potential outcomes are needed for an accelerated and accurate documentation of Dagbani language and linguistics.

References

Blench, Roger. 2004. *Dagbani-English dictionary*. Tamale: Unpublished.

Cahill, Michael & Elke Karan. 2008. Factors in designing effective orthographies for unwritten languages. *SIL Electronic Working Papers*. Dallas: SIL International.

DOC, Dagbani Orthography Committee. 1998. *Approved Dagbani orthography*. Tamale. Self-published.

Dakubu, Mary Esther Kropp. 1997. Oti-Volta vowel harmony and Dagbani. *Gur Papers/Cahier Voltaïques* 2. 81–88.

Fisch, Rudolf. 1913. Wörtersammlung Dagbani-Deutsch. *Mitteilungen des Seminars für Orientalische Sprachen (Berlin)* 16(3). 113–214.

Hudu, Fusheini. 2005. *Number marking in Dagbani*. Edmonton: University of Alberta. (MSc thesis.)

Hudu, Fusheini. 2010. *Dagbani tongue-root harmony: A formal account with ultrasound investigation*. Vancouver: University of British Columbia. (Doctoral dissertation.)

Hudu, Fusheini. 2013. Dagbani tongue-root harmony: Triggers, targets and blockers. *Journal of African Languages and Linguistics* 34(1). 47–73.

Hudu, Fusheini. 2014a. What is the phonological word in Dagbani? A positional faithfulness account. *Ghana Journal of Linguistics* 3(1). 1–44.

Hudu, Fusheini. 2014b. [ATR] feature involves a distinct tongue root articulation: Evidence from ultrasound imaging. *Lingua* 143. 36–51.

Hudu, Fusheini. 2016. A phonetic inquiry into Dagbani vowel neutralisations. *Journal of African Language and Linguistics* 37(1). 59–89.

[3] Beyond this statement by Blench, which lacks further details or references, I do not have details on these government-decreed revisions and the extent to which Dagbani may have been affected. The discussion here assumes that Dagbani was affected by such revisions.

Hudu, Fusheini. 2018. Asymmetries in the phonological behaviour of Dagbani place features: Implications for markedness. *Legon Journal of the Humanities* 29(2). 197–240.
Hudu, Fusheini & Nindow, Mohammed Osman. 2020. The nasal in Dagbani prosody. *Folia Linguistica* 54(3). 527–550.
Karan, Elke. 2014. The ABD of orthography testing: Practical guidelines literacy and education consultant. *Work Papers of the Summer Institute of Linguistics, University of North Dakota Session* 54. Dallas: SIL International.
Ladefoged, Peter. 1968. *A phonetic study of West African languages: An auditory-instrumental survey*. 2nd edn. Cambridge: Cambridge University Press.
Naden, Tony. 2014. *Dagbani dictionary*. Tamale: Ghana Institute of Linguistic Literacy and Bible Translation.
Nunn, Anneke. 1998. *Dutch orthography: A systematic investigation of the spelling of Dutch words*. The Hague: Holland Academic Graphics.
Olawsky, Knut. 1999. *Aspects of Dagbani grammar: With special emphasis on phonology and morphology.* Munich: LINCOM Europa.
Sebba, Mark. 2007. *Spelling and society: The culture and politics of orthography around the world*. Cambridge: Cambridge University Press.
Smalley, W. A. 1964. How shall I write this language? In Smalley, W. A. (ed.), *Orthography studies,* 31–52. Amsterdam: North-Holland Publishing Company.
Venezky, Richard L. 1970. Principles for the design of practical writing systems. *Anthropological Linguistics* 12(7). 256–270.
Wilson, W.A.A. & Bendor-Samuel, John. T. 1969. The phonology of the nominal in Dagbani. *Linguistics* 7. 56–82.
Winer, L. 1990. Orthographic standardization for Trinidad and Tobago: Linguistic and sociopolitical considerations in an English Creole community. *Language Problems and Language Planning*, 14(3). 237–268.

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