A Proposal for a Spatial Morphology of Verb Forms in EFL/ESL to Develop Cognitive Structures using Mobile Apps

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Abstract

In the provision of ubiquitous language learning, it is advisable and likely necessary for appropriate learning objects to be made accessible to learners at the right time and in the right place. Mobile devices and relevant apps have the potential to meet this need. The use of correct English verb tenses and forms causes understandable confusion for EFL/ESL learners. The best place that the required learning objects can be situated is in the learner's awareness; they may then creatively imagine the necessary schema, navigate through it, and determine the correct formal expression of what they intend. To aid that process, I propose a spatial morphology of English verb forms and tenses that is applied to generate simple sentences. This is intended to encourage appropriate cognitive structures to form and stabilize in the language learner's mind. The spatial schema simultaneously allows ready on-screen implementation in interactive mobile applications for smartphones and tablets, as well as for head up displays, and online grammatical resources such as webpages. The primary intended realization is thus two-fold and complementary: as an *aide-mémoire* in the learner's mind, and as a proposal for an App for the iPad (as yet unrealized).

Keywords: verbs, simple sentences, mobile apps, language learning objects, iOS/iPad.

I. Introduction

Fiaidhi (2011) is timely in her observation that in the rush towards ubiquitous learning, appropriate learning objects need to be made accessible to learners at the right time and in the right place. This applies to language learning, where quite understandably EFL/ESL students face confusion in their recall, choice and use of English verb tenses and forms that are deemed appropriate to an intended context. Naturally, the best place to locate such learning objects is, through assimilation, in the learner's own awareness, so that they are then enabled to creatively imagine the necessary schema, navigate through it, and determine the correct formal expression for what is intended. Providing an adequate spatial morphology of these tenses and forms offers the potential of more effective learning, which may be achieved through assimilation of appropriate cognitive schema, in a process supported by exposure to relevant interactive apps. Here spatial morphology is used not in the usual linguistic sense, but in the traditional sense of a formal organization that exploits spatial relationships.

FIGURE 1
The basic structure showing a. the main grammatical categories;
b. differentiation of the main grammatical categories into options; and
c. various options as actually presented (with categories appended in grey text).

a.

P	QUALITY	TENSE	VERB	NUMBER	PC
MOOD and MODALITY - EXPANDED		PERFECT	PERFECT CONTINUOUS		PERSON
		ASPECT			
		SIMPLE	CONTINUOUS		GENDER
S	VOICE	MOOD	MODALITY	POLARITY	C

b.

P	finite / non-finite	past / present / future	VERB	singular / plural	PC
- will vary according to mood and modality selection -		*perfect* (typically: connection between events in time; completion of something by a particular time)	*perfect continuous* (typically: continuity up to a particular time)		first / second / third
		simple (typically: events in time; permanent situations)	*continuous* (typically: events as going on or continuing, perhaps at or up to a particular time)		male / female / neutral
S	active / passive	declare/question/direct/subjunct	nonmodal/modal/semimodal/other	affirmative / negative	C

c.

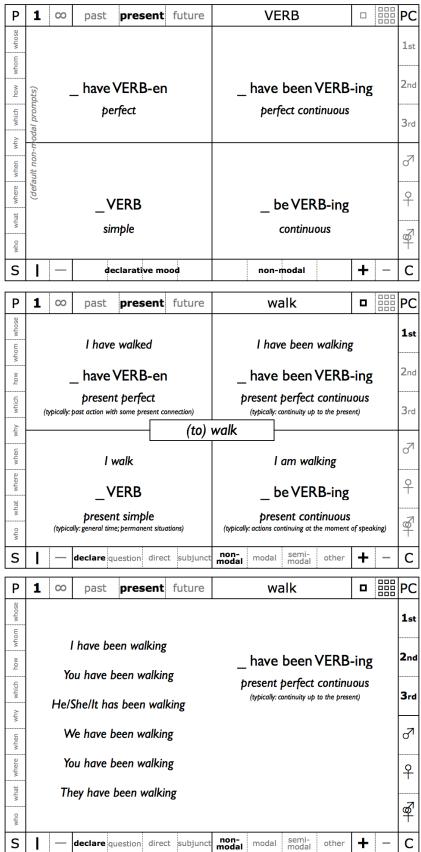| P	1	∞	past	present	future	VERB	□	⊞	PC
- will vary according to mood and modality selection -	*QUALITY (FINITENESS)*		*TENSE*			*VERB*	*NUMBER*		1st
	MOOD and MODALITY - EXPANDED		PERFECT *perfect*			PERFECT CONTINUOUS *perfect continuous*	PERSON		2nd
				ASPECT					3rd
			SIMPLE *simple*			CONTINUOUS *continuous*	GENDER		♂ ♀ ⚥
	VOICE		*MOOD*			*MODALITY*	*POLARITY*		
S	|	—	declare	question	direct	subjunct	non-modal	modal	semi-modal	other	+	−	C

In this paper, I propose a spatial morphology of the English verb forms and tenses applied to generate simple sentences. This is intended to enable appropriate cognitive structures to be formed and stabilized in the language learner's mind. The visual spatial structure is designed to allow ready implementation in mainly landscape mode in interactive digital resources, for use in software that drives on-screen displays. Uses include mobile apps for devices such as smartphones - which students are increasingly likely to have with them both within and outside class, as I elsewhere survey in Meurant (2007a, 2007b, 2007d) - and more particularly in tablets such as the iPad - which it is becoming clear will increasingly be used by students, refer Meurant (2010b, 2010c). Uses also include head up displays (e.g. by computer gamers, Sloodle users, pilots, vehicular drivers etc.); and for electronic dictionaries and online resources such as online dictionaries and other grammatical resource webpages. The primary intended realization of this proposal is thus two-fold and complementary: firstly as an *aide-mémoire* in the learner's mind; and secondly as an App for the iPad. These two realizations complement one another in that using the App will, I submit, help the learner form and stabilize appropriate language structures, while developing facility with those structures can be expected to encourage further exploration and mastery of the App. Thus I envisage that having students use the proposed App would significantly assist their learning of correct linguistic cognitive structures.

II. Formal Structure and Usage of the English Verb App

2.1 Spatial Morphology of the English Verb App

This spatial morphology draws its inspiration from certain configurations commonly found in Sacred Geometry, Art and Architecture. These are utilized because of their effective traditional use in enabling ready learning and contemplation of the often highly complex cosmologies and the realities that they are deemed to mediate (see for example Lawlor, 1982). The primary geometrical form is therefore of the archetypal *aedicule,* which is well known in architecture and in traditional symbolism. It is here represented as a flat vertical rectangular surface in the normal field of vision (rather than as a horizontal plan), as in Figure 1. At the center is situated the Infinitive form of the verb, it being the basic and most essential form that the verb takes (though in practice, it would usually prove more convenient to have this toggled "off"). The surface is developed as a four-fold inner zone, which for a given verb displays its four aspects, sentences that accord with those aspects, their construction, and use. A peripheral border displays other grammatical categories.

FIGURE 2

Finite/Present/Active/Declarative/Non-modal/Affirmative showing:
a. archetypal sentence construction; b. Singular/First Person sentence construction with
central Infinitive shown; c. one full conjugation for all Numbers, Persons and Genders.

a.

P	1	∞	past	**present**	future	VERB		□	⊞	PC

Left column prompts (top to bottom): whose, whom, how, which, why, when, where, what, who
(default non-modal prompts)

_ have VERB-en
perfect

_ have been VERB-ing
perfect continuous

_ VERB
simple

_ be VERB-ing
continuous

Right column: 1st, 2nd, 3rd, ♂, ♀, ⚥

S	I	—	**declarative mood**		**non-modal**		**+**	**−**	C

b.

P	1	∞	past	**present**	future	walk		□	⊞	PC

Left column prompts: whose, whom, how, which, why, when, where, what, who

I have walked

_ have VERB-en
present perfect
(typically: past action with some present connection)

I have been walking

_ have been VERB-ing
present perfect continuous
(typically: continuity up to the present)

(to) walk

I walk

_ VERB
present simple
(typically: general time; permanent situations)

I am walking

_ be VERB-ing
present continuous
(typically: actions continuing at the moment of speaking)

Right column: 1st, 2nd, 3rd, ♂, ♀, ⚥

S	I	—	**declare**	question	direct	subjunct	**non-modal**	modal	semi-modal	other	**+**	**−**	C

c.

P	1	∞	past	**present**	future	walk		□	⊞	PC

Left column prompts: whose, whom, how, which, why, when, where, what, who

I have been walking

You have been walking

He/She/It has been walking

We have been walking

You have been walking

They have been walking

_ have been VERB-ing
present perfect continuous
(typically: continuity up to the present)

Right column: 1st, 2nd, 3rd, ♂, ♀, ⚥

S	I	—	**declare**	question	direct	subjunct	**non-modal**	modal	semi-modal	other	**+**	**−**	C

For the Finite verbs and forms, the bottom left inner quadrant is the starting point for the four fundamental grammatical Aspects, and represents the Simple verb. Extending the Simple form to the right gives the Progressive/Continuous form of the verb at bottom right; while (as it where) an octave of the Simple, directly above, gives the Perfect form at top left. Finally, extending that Perfect form to the right, while simultaneously providing (an octave of) the Progressive directly above, gives the Perfect Progressive/Continuous at top right.

The border around the four edges accommodates the other major grammatical categories, and comprises interactive buttons, tabs, and where needed drop-down menus. The important TENSE-ASPECT-MODE dimensions are thus provided vertically, as in Figure 1. The base form of the verb (the bare Infinitive) is entered or selected from a drop-down menu from the right-hand major top field. Side options of the top and bottom borders provide for grammatical categories of QUALITY (i.e. Finiteness), NUMBER, VOICE and POLARITY. The top right Number field works in conjunction with the PERSON and GENDER categories that are provided in the right side border. MODE, in the bottom border, is differentiated into major fields of MOOD and MODALITY. Contextual fields further expand these options in the left side border. For the purposes of this paper, verbs are presumed to be either Intransitive or Optionally Transitive, and so sentence objects are not required nor displayed. (The left border could instead display TRANSITIVITY fields accommodating Obligatory/Optional Transitive/Intransitive, and interact with verb PROCESS Dynamic/Stative, and verb VALENCY 1/2/3 could be included; see Crowley et al., 1995).

2.2 Envisaged Usage of the English Verb App

The ESL/EFL learner firstly enters a base verb (the bare Infinitive form of the verb) at the top right, either by selecting from a drop-down menu, or by typing (combined with intelligent word recognition and completion); this could display in the center as in Figure 2B (an associated dictionary could also display its meanings). Default settings for the grammatical categories would ideally accord with the most common states for English of the target learner level, but could be reset in a Settings menu, as could varieties of English (UK/US/Konglish/Singlish etc.). The user then selects options from the border fields in accord with the desired use. The minor side fields on the top and bottom borders represent binary choices, and are exclusive "or" choices except for NUMBER, which can have neither, either, or both options selected. The top border QUALITY (Finiteness) provides exclusive choice of Finite or Non-finite Verb form; at bottom, VOICE allows for exclusive Active or Passive choice, while POLARITY allows for exclusive Affirmative or Negative choice.

FIGURE 3
a. Finite/Past/Singular/Second Person/Active/Declarative/Non-modal/Affirmative;
b. Finite/Present/Plural/3P/Active/Declarative/Non-modal/Negative with different verb;
c. Finite/Future/Singular/3P/Active/Interrogative/Non-modal/Positive constructions.

Grid a

P	**1**	∞	**past**	present	future	walk	▫	▦	PC

whose / *whom* / *how* / *which* / *why* — 1st / **2nd** / 3rd

you had walked
_ had VERB-en
past perfect
(typically: action before a particular past time)

you had been walking
_ had been VERB-ing
past perfect continuous
(typically: continuity up to a particular past time)

when / *where* / *what* / *who* — ♂ / ♀ / ⚥

you walked
_ VERB-ed
past simple
(typically: past events)

you were walking
_ been VERB-ing
past continuous
(typically: actions continuing at a particular past time)

S	I	—	**declare**	question	direct	subjunct	**non-modal**	modal	semi-modal	other	**+**	−	C

Grid b

P	**1**	∞	past	**present**	future	eat	□	▦	PC

1st / 2nd / **3rd**

they haven't eaten
_ have not VERB-en
present perfect
(typically: past action with some present connection)

they haven't been eating
_ have not been VERB-ing
present perfect continuous
(typically: continuity up to the present)

♂ / ♀ / ⚥

they don't eat
_ don't VERB
present simple
(typically: general time; permanent situations)

they aren't eating
_ be not VERB-ing
present continuous
(typically: actions continuing at the moment of speaking)

S	I	—	**declare**	question	direct	subjunct	**non-modal**	modal	semi-modal	other	+	**−**	C

Grid c

P	**1**	∞	past	present	**future**	walk	▫	▦	PC

1st / 2nd / **3rd**

will he/she/it have walked?
will _ have VERB-en?
future perfect
(typically: action before a particular future time)

will he/she/it have been walking?
will _ have been VERB-ing?
future perfect continuous
(typically: continuity up to a particular future time)

♂ / ♀ / ⚥

will he/she/it walk?
will _ VERB?
future simple
(typically: information about the future; future events)

will he/she/it be walking?
will _ be VERB-ing?
future continuous
(typically: actions continuing at a particular future time)

S	I	—	declare	**question**	direct	subjunct	**non-modal**	modal	semi-modal	other	**+**	−	C

Major top, bottom and right border fields allow for more than two options. TENSE is contextual, and when Finite Quality is selected, provides for an exclusive Past, Present or Future choice, provided the MODALITY choice is non-modal. QUALITY is used to provide for Finiteness; when the QUALITY is Non-finite, the options will depend upon other settings e.g. whether VOICE is Active or Passive. Along the bottom border, MOOD at left provides for exclusive Declarative (Indicative) "declare", Interrogative "question", Imperative "direct" or Subjunctive "subjunct" choices. The contextual menu along the left side border may be activated by these choices, e.g. when the Interrogative Question is selected, the left border could show Wh- Question words who/what/where etc. as prompts and/or could toggle with Polar Question auxiliaries such as do/does/am/are/is/will/can/may etc. The bottom border at right provides for the exclusive selection of MODALITY: Non-modal, Modal, Semi-modal, or Other modal. When Modal is selected, the contextual menu of the left side border displays the Modals may/might/can/could etc. (which could then be further conditioned by Tense).

The right side border differs in that the choices need not be exclusive but as for NUMBER may be (partially or totally) inclusive, and are intended to function in conjunction with the Number selection (at right of the top border). So PERSON can be selected as none, one, some or all of First/Second/Third; while GENDER can be selected as none, one, some or all of Male/Female/Neutral (in English it is usually only of relevance if Third Person Singular has been selected). These provisions of exclusivity allows the display of just one PERSON, or of a restricted (by user selection), or of a full conjugation.

The App then displays in the inner quadrant the four Aspects of the specific verb base and chosen grammatical categories, showing the four simple sentences, sentence constructions, tenses, and typical uses - which in this proposal have been adapted from Swan (2005). The same Verb form thus assumes the same relative position in each inner rectangle, so that for any given TENSE, the relation between Simple, Continuous, Perfect, and Perfect Continuous aspects is readily apprehensible. Ideally, this sustained spatialization of Aspectual relationships will significantly assist the learner to internalize the language structure.

2.3 Usage of Finger Gestures

When the FINITE quality is chosen, double-tapping any one ASPECT (of an inner quadrant) zooms that quadrant to fill the entire inner space, and could allow more detailed information to be displayed. A full conjugation could be displayed, as in Figure 2c. A two-finger single tap of a zoomed interior collapses it to return to the four-quadrant view.

FIGURE 4
Finite/Singular/3P/Passive/Declarative/Non-modal/Affirmative:
a. Past/Male, b. Present/Female, and c. Future/Neutral.
(Bracketed terms help identify the appropriate tense).

Panel a.

P	1	∞	**past**	present	future	walk	□	▦	PC

Left vertical labels: whose · whom · how · which · why · when · where · what · who
Right labels: 1st · 2nd · 3rd · ♂ · ♀ · ⚥

he had been walked
_ had been VERB-en
past perfect passive
(typically: action before a particular past time)

he had been being walked (?)
_ had been being VERB-en
past perfect continuous passive
(typically: continuity up to a particular past time)

he was walked
_ been VERB-en
past simple passive
(typically: past events)

he was being walked
_ been being VERB-en
past continuous passive
(typically: actions continuing at a particular past time)

S	│	—	**declare**	question	direct	subjunct	**non-modal**	modal	semi-modal	other	**+**	—	C

Panel b.

P	1	∞	past	**present**	future	walk	□	▦	PC

she has been walked
_ have been VERB-en
present perfect passive
(typically: past action with some present connection)

she has been being walked (?)
_ have been being VERB-en
present perfect continuous passive
(typically: continuity up to the present)

she is walked
_ be VERB-en
present simple passive
(typically: general time; permanent situations)

she is being walked
_ be being VERB-en
present continuous passive
(typically: actions continuing at the moment of speaking)

S	│	—	**declare**	question	direct	subjunct	**non-modal**	modal	semi-modal	other	**+**	—	C

Panel c.

P	1	∞	past	present	**future**	walk	□	▦	PC

it will have been walked
_ will have been VERB-en
future perfect passive
(typically: action before a particular future time)

it will have been being walked (?)
_ will have been being VERB-en
future perfect continuous passive
(typically: continuity up to a particular future time)

it will be walked
_ will be VERB-en
future simple passive
(typically: information about the future; future events)

it will be being walked
_ will be being VERB-en
future continuous passive
(typically: actions continuing at a particular future time)

S	│	—	**declare**	question	direct	subjunct	**non-modal**	modal	semi-modal	other	**+**	—	C

Horizontally swiping the interior permits cycling through the TENSEs as in Figure 3. Swiping right regresses the Tense being displayed, while swiping left advances the Tense from Past to Present, or Present to Future. Settings allow the horizontal swipe to also include the Infinitive if desired, enabling the user to cycle through Past-Present-Future-Infinitive.

When just one NUMBER and PERSON has been selected, vertical swiping of the interior zone allows cycling through the six Number/Person combinations, as also shown in Figure 3:

1PS - 2PS - 3PS - 1PP - 1PP - 3PP

(First Person Singular - Second Person Singular - Third Person Singular -
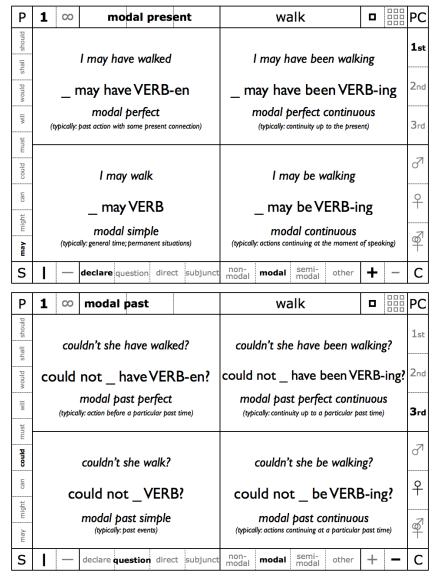
First Person Plural - Second Person Plural - Third Person Plural).

Swiping interior quadrants upwards advances the Number/Person displayed e.g. 2PS > 3PS; swiping downwards regresses the display e.g. 2PP > 1PP.

III. Pros and Cons of the Proposed English Verb App

For the motivated student in particular, this App encourages playful exploration of the effects of varying the values of different grammatical categories and thus allows a deepening appreciation of the structure of the English language, notwithstanding that in this proposal it is applied at a relatively simple level. Further, correspondences between verb forms for a particular tense can be comprehended in relation to other tenses, for example in considering the relationships revealed by a horizontal left swipe sequence of Past Progressive below with Past Perfect Progressive above, Present Progressive below with Present Perfect Progressive above, and Future Progressive below with Future Perfect Progressive above. It then becomes apparent to the learner that the same Verb form assumes the same relative position in each configuration, so that for example the Perfect Past is in top left quadrant of the Past tense, the Perfect Present is in top left quadrant of the Present tense, and the Perfect Future is in top left quadrant of the Future tense. This spatialization of grammatical structure could be expected to significantly assist learning, given that space is one of the most important aspects of our experience of the world; this can readily be seen in the fundamental importance of spatial prepositions in structuring other kinds of formal complexity (refer Meurant, 2007c).

The limitations that are met are primarily those of the structural complexity of language in general and of the English language in particular (even expert Grammarians are not infrequently at odds over issues of linguistic structure!) These constraints must be set against the honest and understandable limitations of the second language learner, who may be completely overwhelmed when faced with the structural complexity of the target language.

a.

P	1	∞	modal present	walk	▫	▦	PC
should			*I may have walked* / _ may have VERB-en / modal perfect / (typically: past action with some present connection)	*I may have been walking* / _ may have been VERB-ing / modal perfect continuous / (typically: continuity up to the present)			1st
shall							2nd
would							3rd
will / must							
could			*I may walk* / _ may VERB / modal simple / (typically: general time; permanent situations)	*I may be walking* / _ may be VERB-ing / modal continuous / (typically: actions continuing at the moment of speaking)			♂
can							♀
might							⚥
may							

S	|	—	**declare**	question	direct	subjunct	non-modal	**modal**	semi-modal	other	**+**	—	C

b.

P	1	∞	modal past	walk	▫	▦	PC
should			*couldn't she have walked?* / could not _ have VERB-en? / modal past perfect / (typically: action before a particular past time)	*couldn't she have been walking?* / could not _ have been VERB-ing? / modal past perfect continuous / (typically: continuity up to a particular past time)			1st
shall							2nd
would							**3rd**
will / must							
could			*couldn't she walk?* / could not _ VERB? / modal past simple / (typically: past events)	*couldn't she be walking?* / could not _ be VERB-ing? / modal past continuous / (typically: actions continuing at a particular past time)			♂
can							♀
might							⚥
may							

S	|	—	declare	**question**	direct	subjunct	non-modal	**modal**	semi-modal	other	+	**—**	C

Thus a satisfactory compromise needs to be maintained between a simplicity that can be comprehended, and a complexity that does the language justice. To that end, the structural morphology presented does not address verbal objects (though it readily could), and is restricted to simple sentences (so compound and complex sentences are not dealt with). The treatments of passive and of non-finite forms have been greatly simplified; and imperative and subjunctive moods as well as semi-modal and other modalities, though provided for, have not yet been included. The proposal thus seeks to balance an adequate complexity with a desirable simplicity that will provide accessibility, in accord with the learner's interlanguage.

The proposed App, including all finger gestures, is designed to fit in broad agreement with the Apple iOS Human Interface Guidelines (2011). The display resolution accords with the 960 x 640 px iPhone screen, but is more appropriate for the 1024 x 768 px iPad screen, on which it fits comfortably. Border widths of 50 px at top/bottom and 48 px left/right mean both dimensions of the 864 x 540 px interior are rich in factors, which allows convenient subdivision into equal columns and rows ($864 = 2^5.3^3$, $540 = 2^2.3^3.5$), while minimum button sizes are adequate. (Color-coding of buttons and tabs, which greatly enhances intelligibility, could not be shown in this paper; note also that images have needed to be reduced in size).

FIGURE 6
a. Non-finite/Infinitive/Active/Declarative/Non-modal/Affirmative and
b. Non-finite/Infinitive/Passive/Declarative/Non-modal/Affirmative sentence
constructions (VERB-en represents the Past Participle of the Verb).

a.

P	1	∞	infinitive		VERB	□	(grid)	PC
whose / whom / how / which / why / when / where / what / who			**(to) have VERB-en** *perfect infinitive*		**(to) have been VERB-ing** *perfect continuous infinitive*			1st / 2nd / 3rd
			(to) VERB *simple infinitive*		**(to) be VERB-ing** *continuous infinitive*			♂ / ♀ / ⚥
S	I	—	declarative mood		non-modal	+	—	C

b.

P	1	∞	passive infinitive		VERB	□	(grid)	PC
whose / whom / how / which / why / when / where / what / who			**(to) be being VERB-en** *passive perfect infinitive*		**(to) have been being VERB-ing** *passive perfect continuous infinitive*			1st / 2nd / 3rd
			(to) be VERB-ing *passive simple infinitive*		**(to) have been VERB-ing** *passive continuous infinitive*			♂ / ♀ / ⚥
S	I	—	declarative mood		non-modal	+	—	C

IV. Conclusion

The ICT revolution is radically impacting pedagogy, as I elsewhere detail in relation to language pedagogy (Meurant, 2010a). In language learning, this is now noticeable in the cognitive schema that might be effectively utilized in conjunction with language learning strategies that are more suited to our digital age. Fiaidhi (2011) rightly maintains that the pervasive impact of the Internet, mobile apps, smartphones and now tablets means that learning objects are required that satisfy demand for ubiquitous learning at the right time and in the right place. The ways in which language is conceived, imagined, learnt, and utilized are, I submit, rapidly changing. Envisaging and developing spatial morphologies that aid learning - via a dialectic between the space of the imagination and the digital realm of mobile apps - will I trust contribute to that exciting educational and technological evolution.

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