Lenticular Print Maps in Teaching Irish Mutations on Initial Consonants

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Introduction

The lenticular foil technique is widely known from the gimmicks in snack and cereal boxes. By today Elvis Presley, Hulk Hogan, Diego Maradona, Arnold Schwarzenegger as well as some jolly green leprechauns, for sure, have been printed on lenticular flip images showing them, usually, in two different ‘heroic’ or funny postures. This visualisation technique is currently “experiencing a renaissance” (Dickmann, 2010, p. 250). At present, its applications are no longer limited to products of commercial art only: It belongs to the modern visualisation methods of thematic cartography (Dickmann et al., 2009; Buchroitner et al., 2005; Buchroitner et al., 2007). Thematic cartography can enter the Irish language classroom when introducing the rules of Irish consonant mutations, i.e. *urú* (eclipse) and *séimhiú* (lenition), in combination with geographic names (Edler, 2010) – see: Corcaigh (Cork), i _g_Corcaigh (in Cork, *urú* is caused by *i*), ó Chorcaigh (from Cork, *séimhiú* is caused by *ó*). The rules of *urú* and *séimhiú* belong to the difficult peculiarities
of the Irish language and, thus, require studying with care. Lenticular print maps, in general, are interesting and useful teaching media to motivate and support students of Modern Irish – and of foreign languages in general.

The Principle of Lenticular Print Maps in a Nutshell

“The lenticular foil technique is a stereographic visualisation tool laid out on a picture.” (Dickmann, 2010, p. 250). Apart from printed flip images, which are in the focus of this paper, there are other lenticular products such as analog as well as digital 3D images and animations (Johnson and Jacobsen, 2005; Dodgson, 2005). In the creation of printed flip images, two or three existing images are dissected into various small stripes. In further steps, these stripes are systematically merged into one image, printed and combined with a transparent foil consisting of an array of half-cylindrical lenses. The final outcome is a single printed product of lenticular manufacturing uniting two or even three different images. Depending on the viewing angle, different stripes of the image shift into the focus of the lenses. Thanks to this optical flip effect, the different original images – in this case maps – can be seen (Dickmann, 2010).

Examples

If, in Modern Irish, a noun follows the preposition i (in) and begins with b, c, d, f, g, m, p, s, and t, its initial letter is eclipsed: mb, gc, nd, fbh, ng, bp and dt. In other words, the unvoiced initial consonants are replaced by the corresponding voiced ones whereas the voiced initial consonants are substituted by the corresponding nasals. In the language classroom, this rule of consonant mutation (urú) can be perfectly introduced using Irish place names illustrated in maps. As lenticular flip maps allow the merging of two different maps into one map, the flip effect can be used to highlight the grammatical and orthographic changes happening to the place names. Thus, by flipping the maps in their hands, the students can read a map of Ireland with either the place names as they are or with the eclipsed names after the preposition i (Appendix 1, figure 1 & 2).

Another Irish preposition often combined with geographic names is ó (from). This tiny word causes that some initial consonants of the following word – i.e. b, c, d, f, g, m, p, s, and t – are lenited: bh, ch, dh, gh, mb, ìb and ìb. Lenition (seimhiú), sometimes referred to as aspiration, means that a consonant is pronounced without a stop of the air flow. In phonological terms, the plosive is substituted by its corresponding fricative. Whenever lenition occurs, it is not only linked to phonetic mutations but also to changes in terms of grammar and orthography. To visualize these changes, another example of a lenticular flip map was designed and produced (Appendix 2, figure 3 & 4).

Aside from linguistic knowledge, lenticular maps also impart geographical knowledge. In fact, the maps can be used to study the approximate locations of the major cities in the Republic of Ireland (Poblacht na hÉireann) and Northern Ireland (Tuaiscirt Éireann). In addition, to ‘build a bridge’ between the Irish placenames and their anglicisations, another pair of maps (Appendix 3, figure 5 & 6) has been interlaced and rendered into a printed map which is based on the lenticular foil technique.

This example allows students the study of space-related vocabulary. While this lenticular print map is an example of “vocab-mapping”, the other maps shown in this paper are rather focused on the visualisation of orthographic changes caused by phonetic peculiarities – thus, they are products of “ortho-mapping” (Edler & Lammert-Siepmann 2010, p. 10).

Summary – The Potential of Lenticular Flip Maps

The examples given in chapter 3 indicate the potential of lenticular print maps for the language classroom. Whenever geographic names are changed according to language-specific rules and peculiarities, this visualisation
technique can be used to produce interesting teaching media. So, the ortho-
graphic consequences of *an t-Úrú* and *an Séimhiú* can be simply visualized
in printed lenticular flip maps. In addition to Modern Irish, there are other
Celtic languages in which the spelling of placenames is modified in some
cases. In the Welsh language (*Cymraeg*), the name of Wales is *Cymru*. If a
Welsh speaker wants to express that he is in Wales, he may use the words
*Yr wyf yng Nghymru*. It is obvious that, here, the original placename *Cymru*
mutated to *Nghymru*. Here, the initial consonant of “Glaschu” is lenited by adding an *h*. Apart from the Celtic lan-
guages, there are also some other European languages in which geographic
names are subject to rules of mutations. A list of examples is given in table 1.

<table>
<thead>
<tr>
<th>Language</th>
<th>Original Placename</th>
<th>Placename in sentence</th>
<th>English translation</th>
</tr>
</thead>
<tbody>
<tr>
<td>Czech</td>
<td>Praha</td>
<td>Chodím do Prahy.</td>
<td>I go to Prague.</td>
</tr>
<tr>
<td>Estonian</td>
<td>Tallinn / Viljandi</td>
<td>Nad lähedav Tallinn–nast Viljandisse.</td>
<td>They go from Tallinn to Viljandi.</td>
</tr>
<tr>
<td>Finnish</td>
<td>Helsinki</td>
<td>Hän on Helsingissä.</td>
<td>She is in Helsinki.</td>
</tr>
<tr>
<td>Hungarian</td>
<td>Magyarország</td>
<td>Én megyek Magyarországra.</td>
<td>I am going to Hungary.</td>
</tr>
<tr>
<td>Latvian</td>
<td>Rīga</td>
<td>Viņš ir Rīgā.</td>
<td>He is in Riga.</td>
</tr>
</tbody>
</table>
| Lithuan-
ian    | Klaipėda / Vilnius | Mes einame iš Klaipėdos į Vilnių.        | We go from Klaipėda to Vilnius. |
| Polish   | Warszawa           | Jedzie do Warszawy.                     | He travels to Warsaw. |
| Russian  | Moskva             | Я в Москве.                              | I am in Moscow.     |

Table 1: Inflections of placenames in other European languages

Printed lenticular flip maps have been used in a beginners’ module
of Modern Irish at the Ruhr-University Bochum (RUB), Germany. The
philosophy of the module is to teach the Irish language while introducing
students to Ireland’s culture and geography. According to the students, these
maps are useful aids to study the orthographic consequences of Irish muta-
tions on initial consonants.

A selection of self-created lenticular maps for the teaching of the Irish
language is available at RUB’s Geomatics Group. If you are interested in
getting further information about the existing maps or in designing your own
lenticular products, you are kindly invited to contact the authors. To design
lenticular flip maps, your image files can be saved in common raster formats
such as jpg or tiff. The individual image files require a minimum resolution
of 300 dpi.

The illustrations shown in the appendix are printed as greyscale images.
The coloured versions of the figures, which are the actual images of the len-
ticular maps that have been used in the Irish language classroom, can be
accessed online:

http://geo-lingo.geomatik.rub.de/lenticular/

References

Buchroitner, Manfred; Habermann, Klaus & Gründemann, Thomas. (2005).
Modelling of three-dimensional geodata sets for true-3D lenticular foil displays.

Buchroitner, Manfred. (2007). Echtdreidimensionalität in der Kartographie: Gestern,

der Lenticulartechnik in der thematischen Kartographie. In *Kartographische


**Appendix 1**

![Figure 1 & 2: Two maps of a lenticular flip map – urch in Irish place names](image1.png)

![Figure 1 & 2: Two maps of a lenticular flip map – urch in Irish place names](image2.png)
Appendix 2

Figure 3 & 4: Two maps of a lenticular flip map – séimhiú in Irish place names

Figure 5 & 6: Two maps of a lenticular flip map – English and Irish place names