3D PRINTED FLUTE FOR ONE-HANDED PLAYING

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ABSTRACT

The **Engineering Design and Technological Development (DIDET in Spanish)** group from the ArtefactosLAB laboratory of the University of Alicante has developed a soprano recorder designed so that children with motor disabilities in any of their upper limbs can learn to play it with only one hand.

The aim is the inclusion of these groups as part of society and the improvement of their autonomy, self-esteem and quality of life.

The group is looking for companies or institutions interested in continuing to develop the device or in the design and manufacture of new ones.

TECHNOLOGY ADVANTAGES AND INNOVATIVE ASPECTS

MAIN ADVANTAGES OF THE TECHNOLOGY

This soprano recorder has a number of outstanding advantages:

- Adapted for playing using only the **five fingers of one hand** (left or right-handed), four fingers for opening and closing the holes and the other finger for holding the recorder.
- **Smooth** but resilient finish.
- Dimensionally **stable**, **strong**, **durable** parts with **good precision and durability**.
- Quick and easy access to **spare parts**.
- **Easy** to learn and use thanks to its **lightness** and **ergonomics**.
- Offers a **compact finish** and **unique aesthetics** to appeal to both boys and girls (*see Figure 2*).

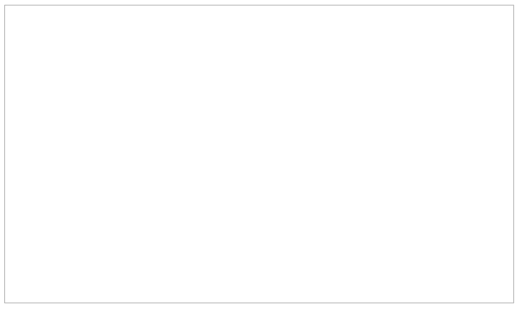

Figure 2: Perspective view of the fully assembled flute.

- Improving the **autonomy** and therefore the **quality of life** of school-age children.

INNOVATIVE ASPECTS

3D printing, together with the use of three-dimensional models, has become an alternative manufacturing process to the conventional one. Its application within assistive technologies opens up endless possibilities for improving the quality of life of people with functional diversity, mainly due to the following factors:

- **Low cost** of materials and equipment needed.
- **Freedom of design** that allows to approach to personal needs and to obtain totally personalised devices.
- **Speed** of **manufacture**.
- **Manufacture anywhere in the world,** giving the user or music education professional the possibility of self-manufacturing their own device, which also means savings in logistics and distribution.

MARKET APPLICATIONS

This invention is framed within **assistive technologies**. It is mainly focused on the first stage of **school music education**, although it could also be a support tool in other areas in which both the improvement of **cognitive abilities** and **physical skills** are worked on.

3D printing or additive manufacturing is a technique that can be applied to satisfy any need, in any field, that a person may have. It is especially useful for **people with functional diversity** with very personal problems in fields such as **medicine**, **education**, **work** or **mobility**.

COLLABORATION SOUGHT

From ArtefactosLAB, the DIDET group is looking for companies or institutions interested in **supporting the development** of the instrument or in the design and manufacture of other devices for people with functional diversity.