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A CROSS-PLATFORM EDUCATIONAL GAME FOR LEARNING FOREIGN WORDS

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1. Introduction

1.1 Basic motivation

Nowadays several applications designed to learn foreign languages are available. This thesis will develop this field and will try to make this market bigger.

One of the main concerns of the parents is whether their children learn more than one language or not. Today we live in a globalized society where you are under almost obligation to speak English and sometimes it is not even enough. That is the reason why parents try to teach their children new languages. One easy way to do so is downloading games to learn, because children love to play and, then, it is the perfect way. With fun and enjoyable games, children will learn words, grammar and how to speak in another language almost without realizing it.

This thesis’s purpose is the development of an application for children so that they are able to learn new words in another language in an easier and in a funnier way.

The application will have several kinds of games; such as choosing the correct picture with a word given, connecting pictures with the correct word, typing the word with a picture given or translating the word given.

There will be three languages available to learn, Spanish, Croatian and English. These three languages have been chosen due to the developer nationality, which is Spanish, and the fact that he is taking the Erasmus Program in Zagreb. The thesis will be a useful application to set Spain and Croatia closer, and give children the chance to learn these three languages.

It has been a fantastic experience to do the thesis in a foreign country. This is a chance to improve and apply the knowledge acquired during the bachelor. Furthermore, it is an opportunity to learn some Croatian culture and language, to meet Croatian people, travel around the country and many other things. It will be unforgettable without no doubt.
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The application will be developed in C++, using the program Qt creator, which is a multiplatform program designed to create interfaces. Therefore, using this program is a good choice for making this kind of platforms. The database has been developed in Sql Server.

1.2 Structure of the thesis

This document will be an explanation of the whole thesis. Firstly there is an overview of other similar videogames and solutions in which the best option to develop this kind of games is analysed. Next, there is the requirements section, explaining what users can do, including diagram use case, the functions of the system and the requirements that the system must follow.

Furthermore, there is an overview of the solution, talking about technical issues. Mainly, databases model, a class diagram and some interesting solutions.

Finally there are the conclusions talking about the thesis, how difficult it has been, things which could be improved, etc. In the last pages there are the references, which were useful to develop the game.
2. Related work

Having done a deep search, it can be seen that there are many applications for children designed to learn foreign words. This section is going to talk about some of these solutions and the difference between this game and the others.

Firstly a description of this application will be done.

In the Home Screen the user must choose the game, the language and the level. There are four different games to play, three languages to learn and two levels. If the user choose the game Translate, the user has to choose the language to translate the word given to.

Now all the games will be analysed.
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Illustration 2-2 Game 1

In the illustration above, the user must connect the picture with the word that describes the image. If the answer is correct a line will be painted and a check will appear.

Illustration 2-3 Game 2
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In the second game the user must choose the correct picture that is related to the word given.

In the third game the user has to write the name of the picture given. Each letter fits in each box. The user can play the sound of the word and can ask for a hint. When they ask for the hint a letter in a random position is given.
In the last game, the user has to translate the word given. The user can also play the sound of the word and can ask for a hint.

After having introduced how the thesis is, now a description of similar games that already exist will be done.
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Firstly, we can find ABC First Vocabulary for Kids for Learning Words. You can work with several words to learn in this app, but you only have one game available.

It is very similar to one of the games in the thesis. It is a good game to learn new words, but the fact that it only has one game and that the words are divided by categories could be boring for children.

Another good game could be ABC English for Kids, where you can find different kinds of games, such as games with sound, which is a good way to learn how to pronounce the words.
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You can also find some of these types of game in our platform with some differences but keeping the same idea. This app does not distinguish between categories, all the words are mixed. This app is more complete than the other one because you can choose the game to play, what makes the app more enjoyable.

To summarize this section, English for Kids Free is a good option. This game is a bit different. Firstly they teach you some words and you can also hear the word and then you have to do a test to prove what you have learnt. Moreover, the lessons are divided in categories, which is a good way to learn how to classify the knowledge gotten.

It can be easy noticed that all the games are designed to learn English. Almost all the games are only created with the aim of learning just one language. In our game you can learn up to three languages. That is one of the main reasons why our game is more complete than the others. Moreover, we have four game options to make it more enjoyable.
3. Requirements

A requirement is a definition of something that must be achieved. The requirements show how the project will be when it is finished. They are essential to define a good project and to know all the things that the project must have.

3.1 User requirements

User requirements give us an idea of how the user moves around the system. Basically user requirements say what users can do. We can see that with the use case diagram.

Illustration 3-1 Use Case Diagram
3.2 Functional requirements

The functional requirements describe the interactions between the user and the software, which are all the functional actions of the system.

First of all, the home screen (*MainWindow*) has a lot of radio buttons and push buttons. Radio buttons allow you to choose an option among a list and push buttons are buttons you can click to make them do what they are designed for. We will see what happens with each button.

In the first column, the user chooses which game to play. The options are:

- *Connect the pictures*
- *Choose the correct picture*
- *Write the name of the picture*
- *Translate*

In the second column there are the languages that can be chosen and in the third one there are the levels.

When the user pushes the button *PLAY* a new window is opened according to the game the user has chosen. If the user forgets to choose the language or the level nothing will happen until this same user chooses the game, the language and the level. If the user pushes the button *EXIT* the game’s window will be closed.

If the user wants to play the game *Translate*, the user must choose the language in which the word will appear and the language it has to be translated to. When the user clicks on *Translate* a new column will appear between the second and the third column, in order to choose the language to be translated to. If the user clicks on *PLAY* and the two languages chosen are the same nothing will happen. The user must choose two different languages for the game to work.
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In the first game the user has to link the pictures with the correct answer. He or she has to click on the picture and then click on the correct word that describes the image. If the answer is correct a check will appear next to the word, and a line will be painted linking the picture and the word. If the answer is wrong a symbol of incorrect will appear next to the word and an alarm bell will be played. When all the answers are correct, a sound of people clapping will be played.

When all the answers are correct the user must push the button NEXT and a new window with other pictures will be opened.

If the user wants to change the game, the button Back to Menu must be pushed and the home window will appear.

In the second game, given a word the user has to choose the correct picture according to it.

In order to choose the picture, the user just has to click on the picture. If the answer is correct a check will appear in the right side of the screen and the sound of people clapping will be played. If the answer is not correct an incorrect symbol will appear and an alarm bell will be played.

The buttons NEXT and Back to Menu work in the same way as in the first game.

In the third game the user has to write the name of the picture given. Each letter fits in each box.

In this game the user can push up to five buttons. The button Sound will play the name of the picture. When the user writes all the letters, the button OK must be pushed afterwards. If the answer is correct a check will appear and a clapping sound will be played. Otherwise, if the answer is not correct a wrong mark will appear and an alarm bell will be played.

If the user does not know how to write the word, the button ? can be pushed, which gives a clue letting the user know one letter of the word. This letter will appear in the correct position. The user can push this button until the whole word is written.

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The buttons NEXT and Back to Menu work in the same way as in the other windows.

In the last game, the user has to translate the word given. As said before, the user must choose the language of the word and then the language to be translated to.

This game has been developed in the same way as the third one, meaning that all the push buttons work in the same way.

3.3 Non-functional requirements

The non-functional requirements are the requirements that detail the rules that judge system operations rather than their behaviour. They are those requirements that describes not what the software will do, but how the software will do it.

First of all, the system must be connected with the database at the beginning of the execution because all the pictures, the names, and the sounds are located in the database. Without this connection the system will not work.

Moreover, the interfaces will be simple to make the playability easy for the kids. The interfaces will have only the essential to play.

When it moves from one window to another, the information about the last window will be deleted, and a new window will be created. When it moves from one window to the home screen, the information will be deleted too.

The home window will have a button to close the game.

All the games will have an option for the user to be able to come back to the home screen.
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When the answer is correct a check will appear and a sound will be played to encourage the kids to keep playing and being motivated.

However, when the answer is incorrect a cross will appear with an alarm sound. The games *Write the name of the picture* and *Translate* will have some kind of hints to help the kids and give them the opportunity to answer and learn the new word.
4. **Solution overview**

In this section the solutions used to develop the videogame will be analysed, it will also focus on the databases, the different classes and will do an overview of some interesting algorithms.

4.1 **Database model**

For this kind of application it is necessary to start with a database. A database has been developed to file all the names of the words in the different languages, the path of the pictures, the level of the word and the sound of the word.

The best option is to create three tables; one for the language, another one for the path of the pictures and the last one for the names in the three languages; linked between them.
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In these two tables, we can see that ID_language and ID_object are the primary keys. Language name is just the languages available, Photo is the route of the pictures and Nivel is the level of the picture.

<table>
<thead>
<tr>
<th>ID_name</th>
<th>ObjectID</th>
<th>LanguageID</th>
<th>Name</th>
<th>Sound</th>
</tr>
</thead>
<tbody>
<tr>
<td>4</td>
<td>4</td>
<td>1</td>
<td>BARCO</td>
<td>NULL</td>
</tr>
<tr>
<td>5</td>
<td>5</td>
<td>1</td>
<td>BEBE</td>
<td>NULL</td>
</tr>
<tr>
<td>6</td>
<td>6</td>
<td>1</td>
<td>BICICLETA</td>
<td>NULL</td>
</tr>
<tr>
<td>7</td>
<td>7</td>
<td>1</td>
<td>BOLIGRAPO</td>
<td>NULL</td>
</tr>
<tr>
<td>8</td>
<td>8</td>
<td>1</td>
<td>CABALLO</td>
<td>NULL</td>
</tr>
<tr>
<td>9</td>
<td>9</td>
<td>1</td>
<td>CALCETINES</td>
<td>NULL</td>
</tr>
<tr>
<td>10</td>
<td>10</td>
<td>1</td>
<td>CAMA</td>
<td>NULL</td>
</tr>
<tr>
<td>11</td>
<td>11</td>
<td>1</td>
<td>CAMARA</td>
<td>NULL</td>
</tr>
<tr>
<td>12</td>
<td>12</td>
<td>1</td>
<td>CAMION</td>
<td>NULL</td>
</tr>
<tr>
<td>13</td>
<td>13</td>
<td>1</td>
<td>CAMISETA</td>
<td>NULL</td>
</tr>
<tr>
<td>14</td>
<td>14</td>
<td>1</td>
<td>CARAMELO</td>
<td>NULL</td>
</tr>
<tr>
<td>15</td>
<td>15</td>
<td>1</td>
<td>CASA</td>
<td>NULL</td>
</tr>
<tr>
<td>16</td>
<td>16</td>
<td>1</td>
<td>CASTILLO</td>
<td>NULL</td>
</tr>
<tr>
<td>17</td>
<td>17</td>
<td>1</td>
<td>CHOCOLATE</td>
<td>NULL</td>
</tr>
<tr>
<td>18</td>
<td>18</td>
<td>1</td>
<td>COCHE</td>
<td>NULL</td>
</tr>
<tr>
<td>19</td>
<td>19</td>
<td>1</td>
<td>COCINA</td>
<td>NULL</td>
</tr>
</tbody>
</table>

Illustration 4-3 Objet Name Table

ID_name is the primary key of this table. ObjectID is a foreign key referenced to ID_object and LanguageID is a foreign key referenced to ID_Language. Immediately we can see Name which is the name in capital letters in the three languages. Finally Sound is the route to the mp3 sound of the word.

Connecting the database with the program and using the precise queries, it is very easy to work with all the components of the database.

The database also gives us the chance to improve the videogame in an easy way. For instance, you can add another language, more pictures or even more levels.
4.2 Class diagram

This section contains the diagram of all the classes used in the program, with all their attributes and methods and how they are connected.

We can notice that *MainWindow* is the home window of the game, where you can choose the game, the language and the level. *Dialog1, Dialog2, Dialog3* and *Dialog4* are the different games you can play.
4.3 Interesting solutions

Some fascinating points about the programing will be analysed in this section.

Firstly, one thing which deserves a mention is the class `Pictures`. It was created to execute the queries to get the path of the pictures, the name of the object, the identity number and the path of the sound.

```cpp
class Pictures {
public:
    Pictures();
    Pictures(int lev, int lan);
    void keepQuery();
    QString getPhoto();
    QString getName();
    intgetID();
    intgetID_photo();
    void setLev(int);
    void setLan(int);
    QString getSound();
private:
    QSqlQuery pic;
    QString pho, na, sound;
    int id, id_photo, le, la;
};
```

Furthermore, the method `keepQuery` executes a query depending on the language and the level chosen and gets the path of the picture, the identity number of the picture, the name of the picture and the sound of the name from object table and object name table. It keeps this information in the attributes of the class.

```cpp
void Pictures::keepQuery() {
    //LEVEL 1 LANGUAGE SPANISH
    if (le==1 && la==1) {
        pic.exec("SELECT TOP 1
        object.Photo, object.ID_object, objectName.Name, objectName.ObjectID, objectName.Sound
        FROM object, objectName
        WHERE object.Nivel=1  and objectName.LanguageID=1
        and object.ID_object=objectName.ObjectID ORDER BY NEWID()");
        while (pic.next()) {
            pho = pic.value(0).toString();
            id = pic.value(1).toInt();
            na = pic.value(2).toString();
```
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sound=pic.value(4).toString();
}

//LEVEL 2 LANGUAGE SPANISH
else if(le==2 && la==1){
    pic.exec("SELECT TOP 1
    object.Photo,object.ID_object,objectName.Name,objectName.ObjectID,objectName.Sound
    FROM object, objectName
    "
        "WHERE object.Nivel=2 and objectName.LanguageID=1
    and object.ID_object=objectName.ObjectID ORDER BY NEWID()");

    while (pic.next()) {
        pho = pic.value(0).toString();
        id = pic.value(1).toInt();
        na=pic.value(2).toString();
        sound=pic.value(4).toString();
    }
}

//LEVEL 1 LANGUAGE CROATIAN
else if(le==1 && la==2){
    pic.exec("SELECT TOP 1
    object.Photo,object.ID_object,objectName.Name,objectName.ObjectID,objectName.Sound
    FROM object, objectName
    "
        "WHERE object.Nivel=1 and objectName.LanguageID=2
    and object.ID_object=objectName.ObjectID ORDER BY NEWID()");

    while (pic.next()) {
        pho = pic.value(0).toString();
        id = pic.value(1).toInt();
        na=pic.value(2).toString();
        sound=pic.value(4).toString();
    }
}

//LEVEL 2 LANGUAGE CROATIAN
else if(le==2 && la==2){
    pic.exec("SELECT TOP 1
    object.Photo,object.ID_object,objectName.Name,objectName.ObjectID,objectName.Sound
    FROM object, objectName
    "
        "WHERE object.Nivel=2 and
    objectName.LanguageID=2 and object.ID_object=objectName.ObjectID ORDER BY NEWID()");

    while (pic.next()) {
        pho = pic.value(0).toString();
        id = pic.value(1).toInt();
        na=pic.value(2).toString();
        sound=pic.value(4).toString();
    }
}

//LEVEL 1 LANGUAGE ENGLISH
else if(le==1 && la==3){
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```cpp
pic.exec("SELECT TOP 1
object.Photo,object.ID_object,objectName.Name,objectName.ObjectID,objectName.Sound FROM object, objectName "
"WHERE object.Nivel=1 and objectName.LanguageID=3 and object.ID_object=objectName.ObjectID ORDER BY NEWID() ");

while (pic.next()) {
    pho = pic.value(0).toString();
    id = pic.value(1).toInt();
    na=pic.value(2).toString();
    sound=pic.value(4).toString();
}

//LEVEL 2 LANGUAGE ENGLISH
else if(le==2 && la==3){
    pic.exec("SELECT TOP 1
object.Photo,object.ID_object,objectName.Name,objectName.ObjectID,objectName.Sound FROM object, objectName "
"WHERE object.Nivel=2 and objectName.LanguageID=3 and object.ID_object=objectName.ObjectID ORDER BY NEWID() ");

while (pic.next()) {
    pho = pic.value(0).toString();
    id = pic.value(1).toInt();
    na=pic.value(2).toString();
    id_photo=pic.value(3).toInt();
    sound=pic.value(4).toString();
}
}

This method is executed in all the constructors of the Dialogs, sometimes more than one, depending on how many pictures the Dialog has.

In addition, the class `My_Label` was necessary to make the labels clickable. A label is a `QObject` where you can write or attach pictures, but the `QLabel` are not clickable. Consequently this class is totally necessary.

class My_Label : public QLabel
{
    Q_OBJECT
public:
    explicit My_Label(QWidget* parent=0 );
    ~My_Label();

    My_Label();
    QVBoxLayout mousePressEvent(QMouseEvent* event);

signals:
    bool clicked();
};
```

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This class has a method named `mousePressEvent` which emits a signal if the mouse clicks on the label.

```cpp
void My_Label::mousePressEvent(QMouseEvent* event)
{
    emit clicked();
}
```

It is useful to have clickable labels, like for example when a picture has to be chosen or when pictures and names have to be linked.

Another necessary class is `DataBaseConnection`, which is the responsible of opening the database.

```cpp
class DataBaseConnection
{
public:
    DataBaseConnection(const QString &server,
                        const QString &driver,
                        const QString &user,
                        const QString &password,
                        const QString &databaseName,
                        bool trustedConnection=true);

    bool OpenDataBase(QString *error=nullptr);

private:
    QSqlDatabase mDatabase;
    QString mServer;
    QStringList mDriver;
    QStringList mUser;
    QStringList mPassword;
    QStringList mDatabaseName;
    bool mTrustedConnection;
};
```

It has a method named `openDataBase` that returns false if the opening has some error or true if the opening succeed.

```cpp
bool DataBaseConnection::openDataBase(QString *error)
{
    mDatabase.setDatabaseName(QString("DRIVER=%1;SERVER=%2;"
                                    "DATABASE=%3;UID=%4;"
                                    "PWD=%5;Trusted_Connection=%6;")
                               .arg(mDriver)
                               .arg(mServer)
                               .arg(mDatabaseName)
                               .arg(mUser)
```
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MainWindow has a DataBaseConnection attribute. In the constructor this attribute is initialized and openDataBase is executed in such a way that the database is connected in the whole execution.

In Dialog1 the method paintEvent has necessarily been introduced. This method paints a line between one picture and the name of the picture when the kid gets it right. This method is updating permanently.

```cpp
void Dialog1::paintEvent(QPaintEvent *e)
{
    QPainter paint(this);
    QPen linepen(Qt::red);
    linepen.setWidth(1);
    linepen.setColor(Qt::red);
    paint.setPen(linepen);
    if(num1==1 && click5==true){
        paint.drawLine(p1,p2);
    } else if(num2==1 && click5==true){
        paint.drawLine(p3,p2);
    } else if(num3==1 && click5==true){
        paint.drawLine(p5,p2);
    } else if(num4==1 && click5==true){
        paint.drawLine(p7,p2);
    } else if(num1==2 && click6==true){
        paint.drawLine(p1,p4);
    } else if(num2==2 && click6==true){
        paint.drawLine(p3,p4);
    } else if(num3==2 && click6==true){
        paint.drawLine(p5,p4);
    } else if(num4==2 && click6==true){
        paint.drawLine(p7,p4);
    }
```
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if(num1==3 && click7==true){
paint.drawLine(p1,p6);
}
else if(num2==3 && click7==true){
paint.drawLine(p3,p6);
}
else if(num3==3 && click7==true){
paint.drawLine(p5,p6);
}
else if(num4==3 && click7==true){
paint.drawLine(p7,p6);
}

if(num1==4 && click8==true){
paint.drawLine(p1,p8);
}
else if(num2==4 && click8==true){
paint.drawLine(p3,p8);
}
else if(num3==4 && click8==true){
paint.drawLine(p5,p8);
}
else if(num4==4 && click8==true){
paint.drawLine(p6,p8);
}
update();
}

In this code excerpt we can see that a line is painted when two parameters are fulfilled. The first parameter is the position where the name of a picture is written. For example if num1=1, it means that the name of the first picture is written in the first position. If num1=2, the name of the first picture is written in the second position. The second parameter will be true when the kid clicks in the picture and in the correct name, so when the answer is good the line will be painted.

_Dialog4_ has a picture as an attribute; to get the picture, the name and the sound. But in this case we need the name of the picture in the language that the user wants to translate. To get the name translated some new queries are necessary.

name=exa1.getName();
char miquery1[100]="SELECT Name FROM objectName WHERE LanguageID=1 and ObjectID=";
char miquery2[100]="SELECT Name FROM objectName WHERE LanguageID=2 and ObjectID=";
char miquery3[100]="SELECT Name FROM objectName WHERE LanguageID=3 and ObjectID=";
char buf [100];
int id=exa1.getID();
snprintf(buf,sizeof(buf),"%d",id);
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strcat(miquery1,buf);
strcat(miquery2,buf);
strcat(miquery3,buf);

QSqlQuery exa;
if(lang2==1){
    exa.exec(miquery1);
}

else if(lang2==2){
    exa.exec(miquery2);
}

else if(lang2==3){
    exa.exec(miquery3);
}

while (exa.next()) {
    nameTranslate = exa.value(0).toString();
}

The queries are written for all the languages but without writing the ObjectId number, and then a new char, linking the query and the ObjectId, is created. Thus, we will have in the string nameTranslate the name in the language desired.
5. Conclusions

Nowadays we live in a technology world, where everybody uses smartphones, tablets and many other gadgets to make their lives easier. All the industries use technology, so why not increase the use of technology in education?

The main reason why this thesis has been developed is because it can be useful for helping children to learn other languages, which is a basic necessity in this globalized world we live in. It could be used even in schools as a tool for the teachers and, moreover, kids could keep on learning in a fun way back again in their homes. It has only three languages to play with but easily new languages could be added, as the database is developed in a way that adding more languages means just adding the words in the language desired. It could be used, then, in many countries. It could be also updated, as it is also not difficult to add new words or levels in the game.

In addition, the games are fun, practical and easy to play so kids will want to keep playing and they will learn without even noticing.

The game has been developed in a way that you can find the same pictures in consecutive screens. That has been performed this way to let the kid memorize the word properly. If the kid has to answer the same question with only a few minutes of difference, he or she will probably remember the answer and will reinforce the process of learning.

Another positive aspect of this thesis is that it has a lot of possible future work. For example, if one day teachers use this kind of tools to teach, the application could have users to identify each person playing and keep a record of their scores. There could also be users for children, teachers and parents. This way, parents could follow the improvement of their children.

As said, other improvements could be adding new languages, words or levels; and perhaps also new games.

Some computer tools have been needed to carry out this thesis. It has been implemented in Qt Creator. Qt Creator is a cross-platform C++, JavaScript and
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QML created by Trolltech which is part of SDK for the development of applications with graphical interfaces. This program is very useful to make graphical interfaces, so it has been a good choice to develop the thesis in Qt Creator. It is very intuitive and easy to work in with it. C++ has been chosen to develop the thesis.

Another computer tool used has been Microsoft Sql Server Management Studio, to create the database. Microsoft SQL Server is a relational model database management system developed by Microsoft. It was a bit difficult because there was not a previous knowledge about database.

ArgoUML has been another useful tool. This tool has been used to create some diagrams such as the class diagram and the use case diagram.

To sum up, this thesis could contribute a lot to modern society, and could help to introduce more useful technology in the field of education. Including this kind of games in the education system we could encourage children to learn new languages. Finally, it has been a fantastic experience to perform the final thesis in this country. It was an unforgettable experience which has provided me a lot of new knowledge regarding the bachelor and it has also allowed me to grow up as person.
6. References


A Cross-Platform Educational Game for Learning Foreign Words

**Title:** A Cross-Platform Educational Game for Learning Foreign Words.

**Summary:** Using cross-platform frameworks Qt develop an educational game for learning foreign words. The application enables several types of play, which are connecting pictures and words, choosing the correct picture for a displayed word, typing word for a displayed picture, and typing translation of a shown word. There are sets of pictures and word categorized by knowledge levels or users age. A method has been established for extending sets of words and pictures.

**Keywords:** User, game, language, children, learn, application, Croatian, English, Spanish, education, word.
A CROSS-PLATFORM EDUCATIONAL GAME FOR LEARNING FOREIGN WORDS

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Este trabajo de fin de grado es una multiplataforma educativa para aprender palabras en otros idiomas. El objetivo de este trabajo es crear un videojuego para niños para que puedan aprender otros idiomas de forma divertida y práctica.

La tutorización del trabajo ha sido realizada por la Universidad de Zagreb en la Facultad de Ingeniería Electrónica e Informática mediante el programa Erasmus+.

El videojuego ha sido desarrollado en C++, con la ayuda de la multiplataforma Qt Creator, programa muy útil para crear interfaces. Además han sido necesarios otros programas como Argo UML, para el diagrama de caso de usos y para el diagrama de clases. Otro programa totalmente necesario para el desarrollo de esta aplicación es Sql Server, con el que se ha implementado una base de datos donde se guardarán las palabras a aprender, imágenes, sonidos, el nivel de las palabras y los idiomas disponibles. Esta base de datos ha sido creada de tal forma que sea sencillo ampliar el número de palabras disponibles así como los idiomas disponibles.

Los idiomas elegidos para el videojuego han sido inglés, español y croata. Esta elección es debida al país donde se desarrolló la aplicación (Croacia), a la nacionalidad del alumno (España) e inglés por ser el idioma en el que se escribió el trabajo.

Después de hacer una búsqueda profunda sobre videojuegos para niños, juegos online y aplicaciones móviles; se eligieron los diferentes juegos que se iban a desarrollar, siendo los más entretenidos y con los que más se podría aprender, de manera que los niños se lo pasen bien aprendiendo.

Además se investigó acerca de las palabras más adecuadas para niños a la hora de aprender un nuevo idioma, clasificando en dos niveles dichas palabras.

Una vez hecha esta búsqueda y sabiendo cómo serían los juegos y las palabras a introducir, la aplicación quedó de la siguiente manera:

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Esta es la primera pantalla que aparece. En ella debemos elegir el juego al que queremos jugar, el idioma a aprender y el nivel. Una vez seleccionados estos tres parámetros se pulsa el botón PLAY.
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En esta imagen podemos ver el primer juego con el idioma en español y el primer nivel. Este juego consiste en unir las imágenes con sus correspondientes palabras, simplemente clicando encima de ambas, si la respuesta es correcta una línea unirá la imagen con la palabra, además un tick aparecerá a la derecha de la palabra. Si la respuesta es incorrecta una cruz aparecerá a la derecha de la palabra y un sonido de alarma se reproducirá. Cuando todas las respuestas sean correctas un sonido de aplausos sonará. Para acceder a la siguiente pantalla simplemente habrá que pulsar el botón NEXT.

Esta ilustración nos muestra el segundo juego. El objetivo es elegir la imagen correcta dada una palabra. Si la respuesta es correcta una tick aparecerá a la derecha de la pantalla y unos aplausos se reproducirán. Si la respuesta no es correcta aparecerá una cruz a la derecha de la pantalla y un sonido de alarma será reproducido.
En el tercer juego hay que escribir una palabra dada una imagen. Cada letra en cada hueco. Una vez que se completan todos los huecos se pulsa el botón OK para comprobar si la respuesta es correcta o no. Si la respuesta es correcta aparecerá un tick a la derecha de la pantalla y un sonido de aplausos sonará. Si la respuesta es incorrecta una cruz aparecerá a la derecha de la pantalla y un sonido de alarma sonará. Si no se sabe la respuesta se puede pulsar el botón ?, con el que aparecerá una letra cada vez que lo pulses. El botón Sound sirve para escuchar la pronunciación de la palabra.

El cuarto juego consiste en traducir la palabra dada en el idioma elegido. Los tres botones son los mismos que en el tercer juego y sirven para lo mismo.
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Este trabajo de fin de grado contribuye a la sociedad moderna ayudando a niños a aprender nuevas palabras en nuevos idiomas de forma entretenida. Además es cada vez es más común utilizar aplicaciones y programas de ordenador para aprender idiomas por lo que es un trabajo de actualidad.