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Engage At-Risk Students

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*The International Journal of Arts Education* is a peer-reviewed scholarly journal.

# Teaching Computer Music to Academically Engage At-Risk Students

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*Abstract: Music and technologies forge direct links between self and world, self-expression can become more fluent especially when a pupil learns by experience; music helps interpret individual skills and makes the connection between self-discipline and performance in life. A pilot project conducted as a LLP (2009) serves in this paper as case study in order to propose an advanced method to address the widespread problem of dropout from school. Creating a different atmosphere, stimulating the senses, creating new and personal “tunes” helped not only to break the routine but also to develop own “intelligences” (Bornstein and Gardner 1986) in order to create a personal representation of knowledge (Bryson and Hand 2007). The project involved didactic theories from the computer music and the positive outcomes associated with the use of ICTs in order to help students to fall back into learning. Even though the final qualitative and quantitative result of the project in terms of general engagement and key-competence achievement and cross curriculum competences was clear, the paper states further improvements in the method criticising and proposing a renewed approach. In a multicultural context where the main necessity is providing a curriculum that could work for different Countries, the adaptation of a holistic methodology - where the environment is more important than the actual content - could work to achieve the major aim of academic engagement especially when caused by different factors related to different cultures.*

*Keywords: Computer Music, Education through Music, Learning Teaching Strategies, Holistic Approach, Constructivism, Inclusivity, Inter-Disciplinarily*

## Introduction

The objective of the E-motion project (2009) was very ambitious: engaging students at risk of dropping out back into learning with particular care of those at high risk. E-motion consists of 3 pilot studies each in a single school in a different country: Italy, Romania and the UK. The attention focused on international students/teachers in particular in relation to their particular social-cultural condition and interests. Each country approached the task of incorporating ICT and music into their teaching with adjustments for local procedures.

The redesigning of the previous traditional programme was based on the use of musical technologies as a vehicle to motivate and inspire the curiosity of the “at-risk young students,” with the aim to provide them with new competences and knowledge, useful to their feeling of *social inclusion*. Making electronic music required elements of mathematics, physics and informatics. Respect to the inhomogeneity of the Countries, diverse school curricula, educational systems unwilling to accept innovation and alternative process, some teachers were reticent admitting that they did not have the necessary requirements to support informal teaching based on ICTs. Schools do not often have the sufficient infrastructures and technologies to carry out innovative processes based on experimental ICT learning. Developing approaches such as those of Mann (2001), which can emphasise the socio-cultural feature of a learning experience can be very important in order to understand and face the diversity of the issue of engagement (Bryson and Hand 2007). Achieving an inclusive design together with a constructive alignment in a context of a learning community would help tremendously in order to create a long life learning experience and a feeling of social inclusion for the involved students.

## The Phenomenon of School Dropout in Europe

There is no unambiguous way to measure or to define the concept of early school leaving. Different institutions, nationally as well as internationally, use a different kind

of definition. Each of the definitions brings other results and another number of early school leavers. Together with the differences on national level (different educational systems, different length of compulsory learning, etc.) conceptualising and measuring is not an easy task. This variety of definitions makes it difficult to compare different figures and to form a consistent state of play on the concept of early school leaving. (Youthforum.org 2008)

Even today, early school leaving is an emergency situation.

In the 2010 the Council of the European Union proposed to the European Council in June 2010 the numerical rates of the EU headline targets in order to improve education levels of the new strategy Europe 2020, building on the two corresponding levels of European average performance (“European benchmarks”) approved in the strategic framework for European cooperation in education and training (ET 2020), that is by 2020, the school drop-out rate should be less than 10% and the share of population having completed tertiary or equivalent education should be at least 40%. (Europa.eu 2015)

Schooling affects individual non-cognitive skills and attitudes, such as risk aversion, patience and motivations. It is ascertained that those skills in a young population influence economic choices (Brunello and Paola 2014, 22). Individual decisions to undertake further education have social consequences, and affect both state finances by raising tax revenues and reducing welfare benefit payments and social welfare, because of their effects on crime, attitudes toward minorities and immigrants and political participations (Belfield and Levin 2007). Students with poor academic skills are more difficult to teach, which enhances the deficits in skills needed for future educations. This may lead to student frustration in the University path or decision not to undertake any further education pathway (Payne and Welch 2015, pp.237-251).

The strategy to introduce pilot projects involving a systemic change in the way the didactic delivery is provided, is very common. The underlying belief is that working more effectively for children at risk would also be beneficial of all children (Schargel and Smink 2014). There is a growing trend to recognise that minorities and young with special needs aspire to active participation within the mainstream of society. Such new expectation offers a rationale for an inclusive curriculum design that is more closely aligned to contemporary social expectations.

## **Creativity Towards Academic Abilities and Student Engagement**

A possible working definition of youth could be “the passage from a dependant childhood to independent adulthood” used by the working document accompanying the EC communication “Youth – Investing and Empowering” (Aei.pitt.edu 2015). Creating a correspondence between the category of “youth” and a simple quantitative concept defined by age is not possible. Youth embraces cultural dynamics with aspects of socio-economic, demographic lifestyle and personal peculiarities. Sometimes the society tends to impute to the increasing maturity of young people their deviated emotional development or their lifestyle. Obviously this vision is a little simplistic. E-motion involved three different Countries with completely different social-economic and demographic aspects. The definition of “young at risk” in those Countries should be differentiated because different issues lead young people to dropout from school. In order to address the same problem in different Countries the focus has been given mostly on the concept of social exclusion/inclusion because it was easier to find similar variables and actions in term of didactics to be undertaken. For the European Commission the social exclusion is “a process whereby certain individuals are pushed to the edge of society and prevented from participating fully by virtue of their poverty, or lack of basic competencies and lifelong learning opportunities, or as a result of discrimination” (Eur-lex.europa.eu 2015).

Technologies and music represent two extraordinary tools to introduce students to the study of less artistic and more complicated subjects. The teenager is in a particular stage of development of traditions and customs, rules and codes that must be considered. Addressing these life events with their rites is sometimes extremely difficult because of conflicts with the parental models, educational and social, personal desires, emotions, hormonal disorders strongly experienced by those teenagers, in their bodies and minds.

Helping people to be creative is a good thing; people tend to be more satisfied if they are able to be creative; individually and collectively we need to be creative to continually adapt and invent in an ever-changing and increasingly complex world. (Jackson 2006, 1)

Students can become more effective learners and, ultimately, successful people if they can recognise and harness their own creative abilities and combine them with more traditional academic abilities.

Many European nations recognise the need to revise curricula to meet the demands of today's workplace. At the same time, they must integrate growing immigrant population into their existing school systems and address the functional illiteracy of an "educated" population. Approximately 10 to 30 per cent of the World's population has difficulty with basic reading, writing, and numeracy skills. (Schargel and Smink 2001). This group unfortunately may fail basic skills testing in primary schools, may fall behind, and may dropout in secondary school. In Europe, too many young people dropout of school without basic skills and competencies that are key to the knowledgeable society and vital for getting a job. They face the risk of social exclusion; furthermore, they have been practically excluded from lifelong learning since birth.

To reduce early school dropout it is important to involve an alternative innovative teaching methodology. The key action is to try to change the way a student learns and to do so it is always important to better understand the level of student engagement towards the project achievement. Harper and Quayle (2009) defined student engagement as "participation in educationally effective practices, both inside and outside the classroom, which leads to a range of measurable outcomes." Akey (2006) claims engagement is: "the level of participation and intrinsic interest that a student shows" and which involves behaviours, attitudes and affect (Baron and Corbin 2012, 759-772). To help children to achieve an improved engagement in school it is fundamental to focus on enrichment through cultural and common current interests such as music and art, the use of technology, social skills, problem solving skills in computer science, autonomy.

Creating a different atmosphere, stimulating the senses, creating new and personal "tunes" help not only to break the routine but also to develop a student's own "intelligences" (Bornstein and Gardner 1986) in order to create a personal representation of knowledge (Bryson and Hand 2007).

### **Music Technology, ICT and Non Musical Skills.**

Several studies of the European Commission in the last two decades show the positive impact of technologies on learning. The beauty of technology-enhanced learning is that it can adapt and make the experience of learning an individual experience. It is important to investigate how technology can drive personalised learning. (Old.caba.org 2015). Another recent study carried out for Institute for Prospective Technological Studies on the use of Learning 2.0 (Ipts.jrc.ec.europa.eu 2015) for social inclusion identified a range of positive outcomes and impacts associated with the use of ICTs that contributed to re-engaging young people (Is.jrc.ec.europa.eu 2011). These included improving math and literacy, inculcation of digital literacy, supporting team-work, reducing stigma, reducing "gang antagonism," thus helping form greater confidence and self-esteem; increasing motivation to learn more, reducing marginalisation, supporting active citizenship, broadening the horizons of young people and allowing them to realise their sense of self belief (Education and Training 2010). The individual

instructors have been invited to make choices about complementary technologies choosing technological tools with flexibility (Collis and Moonen 2002).

When students learn from experience, music and technologies mold direct links between themselves and the world (Hager 2013, pp.105-107), they will reach a more confident self-expression. The music helps interpret “who I am.” It is only a short hop from creating music using technologies to making the connection between self-discipline and performance in life. Music education also provides a critical introduction to the strengthening of academic and personal skills such as critical thinking and learning how to work co-operatively toward shared goals (National Commission on Music Education 1991).

If children have a good interest in music and art in general they will easily accept the positive aspect of ethnic difference. It will be easier for them to overcome their prejudices and biases and to mitigate conflicts and resolve them without the use of violence (Birzea 1996). It is the first step that should be undertaken to solve an integration issue. Additionally integration is a good starting point in order to reach a lasting self-discipline. Children with social competence show responsiveness and reactivity to others, they are able to adapt to new situations, they also have the ability to empathise and care and they can develop good communication skills. These children can get along with adults as well as their peers. The first main aim is to enhance problem-solving skills. It is known that those skills help to seek alternative solutions to the problems, whether cognitive but also social (Schargel and Smink 2001, p.230).

Music Technology and music education promote several non-musical skills important for success in school and life: self-esteem, self-discipline, creativity, academic and personal skills. Such skills are both implicit and explicit in music technology teaching. Learning maths through experience gives a solid foundation reinforcing in an incidental manner the analytical dimension of higher cognitive skills. The implicit learning (Sager 1994) is not capacity limited, it is less related to ages and should be independent of IQ (Kirsner 1998).

Abstract concepts such as counting, fractions, and ratios become meaningful when applied in a musical context. The relationships between symbol and context are much more easily made. Music requires the integration of eye-hand co-ordination, rhythm, tonality, and the recognition and interpretation of symbols, concentration, and other synthetic aspects of human intelligence (National Commission on Music Education 1991).

## **Suggested Changes Towards a Holistic Curriculum**

The aim of education should be to focus on any approach to education, trying to capture features and best practice adoptable in the context of application.

Pioneers such as Maria Montessori, Rudolf Steiner, John Dewey among others stated that the education has to be understood as the art of cultivating the moral, emotional physical and spiritual dimensions of the developing pupil. In the 1970s a cultural movement started the perspective known as holism. The holistic education lies in its responsiveness to the diverse learning styles and needs of evolving human beings. The feeling of connection, for example, achievable fostering collaboration rather than competition in classroom helps enormously students at risk of exclusion. It is strongly suggested to keep in mind, while designing a curriculum to use real-life experiences and other lively resources of knowledge encouraging reflection and questioning rather than pushing to memorise notions.

The American psychologist Abraham Maslow (1970) referred to this as “self-actualization.” It seeks to engage students encouraging personal and collective responsibility. The fact that students need to learn about themselves involves self-respect and self-esteem. It is very important in order to learn about relationships, social influence and emotional literacy. Another important concept involved into the self-actualisation is the *resilience*. Challenges, difficulties have to ensure a long-term success and not to represent an obstacle.

Strategies of holistic education promote a *transformative approach* to learning that “involves a change in the frames of reference that a person may have” (Hent.org 2015). The result is that each student is asked to “develop critical and reflective thinking skills” and he/her is encouraged “to take care about the world around.” This process requires obviously personal and/or social transformation at different degrees.

Another not secondary important feature involved is related to the idea of *connections* as opposed to the fragmentation, often adopted in the mainstream education. This fragmentation often includes subdivision of subjects, ability groups division, etc.

Martin (2002) explored this point further by considering that, “many alternative educators argue that who the learners are, what they know, how they know it, and how they act in the world are not separate elements, but reflect the interdependencies between our world and ourselves” (Ojs.great-ideas.org 2015). The idea of connection obviously includes the way the classroom is structured. Classrooms should be small and consist of mixed-ability students. As explained later E-motion decided to accept the *ability grouping* proposed by the UK school, not desirable especially when the principal aim of a project is to help integration.

Together with the idea of connection in holistic education is the *trans-disciplinary inquiry*, based on the idea of eliminating division between subjects. Trans-disciplinary inquiry approach has been strongly adopted during the planning of the E-motion project curriculum obtaining considerable results in term of learning outcomes.

Trans-disciplinary approaches involve multiple disciplines and the space between the disciplines with the possibility of new perspectives “beyond” those disciplines. Where multidisciplinary and interdisciplinary inquiry may focus on the contribution of disciplines to an inquiry trans-disciplinary inquiry tends to focus on the inquiry issue itself. (Hent.org 2015)

Finally the sense of *community* is a fundamental aspect in holistic education. Learning about personal relationship are keys to understanding ourselves, and this is why the aspect of community is so important in the holistic learning process (Beer et al. 2015, pp.161-185).

In holistic education the classroom is often seen as a community, which is within the larger community of the school, which is within the larger community of the village, town, or city, and which is, by extension, within the larger community of humanity (Putnampit.com 2015).

The following chapters will contextualise well known aspects of traditional approaches within a holistic view centred on collaboration, trans-disciplinarily and connection. In fact keywords often used within the holistic approach, have a direct link with the integration aimed by the inclusive approach. At the same time the constructivism approach is intrinsically a holistic approach due to the flexibility of its nature.

## **Inclusive Approach**

The terms inclusion and diversity have become suffused with specific and often politically loaded meaning. They have frequently become associated with particular aspect of higher education, such as widening participation initiatives, international or disabled students (Grace and Gravestock 2008, 1).

Traditional approaches to the disadvantage of individuals focused on integration in an existing context, minimising the difference between individuals, have been recognised as a factor that helps to create and perpetuate disadvantage (Grace and Gravestock 2008).

In the planning of the E-motion, curriculum has not been considered with sufficient care the principles of “inclusive curriculum design.” Achieving an inclusive design involves curriculum planning that forges strong links between educational intentions, course content, teaching and learning methods, and the assessment of student learning while taking full account of student characteristics. The dimensions of diversity are related to educational, dispositional, circumstantial and cultural features. While the educational dimension is related to student life, work experience and learning approaches, the dispositional dimension is more related to self-esteem, confidence and interests but also to gender and sexuality. The age, the geographical location and the economic background are part of the circumstantial dimension. On the contrary language, religion and social background are part of the cultural dimension (Morgan and Houghton 2011). All these features have been part of the daily process of curriculum plan, however it was very difficult to find a common curriculum adaptable to all the involved Countries especially due to the different reasons that lead students to dropout from school.

An *anticipatory approach* would help enormously in order to reduce the need for individualised actions that have been arisen during the pilot project. Especially in an educational project where different Countries are involved it is important to address the problem of providing similar approaches (adapted to different social background) having in mind the primary task of evaluating the whole project. Additionally mainstreaming diversity rather more than adapting curricula to address the needs of specific groups or protect students against exclusion would help in order to drive students to experience the new educational path as an anomaly, an exception to the norm. It is important that pilot projects such as E-motion do not leave the impression of an experimental delivery of subjects of minor importance.

*Ability grouping* has been requested especially from the involved UK school (Liverpool). It is known that social composition of the classroom primarily affects the cognitive component of knowledge and skills. Obviously this is influenced by national education system. Schools that do not adopt the ability grouping are more homogenous. It is important to consider that in general several Countries adopted ability grouping due to major differences in social composition (highest degree of social segregation) (Janmaat 2011). Grouping pupils by ability is antithetical to the general idea of inclusion and can obviously be limiting or harmful to those assigned to a different level of ability (Feiler and Gibson 1999). In the case of E-motion, only selected students with special needs have been included in the pilot project pathway. This is not only discriminatory in term of exclusion of students from a project adopted by the school but it also can influence enormously the outcome of the whole project. Sebba and Ainscow (1996, p. 13) acknowledge that “system of setting, banding or streaming based upon pupil characteristics seem to be largely incompatible with developing inclusion” and it is clearly comprehensible that a Lifelong Learning Project should embed principle of inclusivity design especially if the aim of an educational project is to help the feeling of social inclusion of young at risk, as E-motion was.

## **Constructive Alignment and Intended Learning Outcome**

“Bologna Process” (Keeling 2006) does not prescribe an outcomes based approach to teaching and learning, but it is suggested by the emphasis on student-centred learning and on learning outcome. Also the emphasis on lifelong learning suggests a learner centred approach. Huet et al. (2009) argue the adoption of “curriculum maps” to facilitate alignment between learning outcomes, learning activities and assessment tasks.

A goal for the design of culturally inclusive online learning is to ensure that pedagogy and curriculum are flexible, adaptable and relevant to students from a diverse range of cultural and language backgrounds. In addition, assessment tasks need to be aligned with learning outcomes and teaching approaches so that all aspects of pedagogy are supportive of cross-cultural learning needs. (McLoughlin 2001, 7-29)



The evaluation methodology for the Emotion project has been conducted to evaluate its effectiveness in improving the school performance of young children at risk of exclusion (Education and Training, 2010). In the case of E-motion the project evaluation has been somehow merged with the obtained student learning outcomes. This is not recommended because it will limit both the possibility of improvement of the curriculum and the focus on the intended learning outcomes within the planned educational pathway.

Before the project commenced, data was gathered from each school: attendance of students to regular school activities, marks obtained in the selected subjects (mathematics, physics, ICT), marks obtained on attitude (if available), or alternatively reports by teachers on the learners' attitudes. During the pilot project quantitative and qualitative measures have been taken. Also specific records of the activities performed and the competencies acquired had to be taken, so that for each student it is known whether they followed fully the activity and with what result. Informal questions to learners and teachers helped complete the picture on the execution of the experiments and on their impact on learners.

As stated into the final report of the project, after the experimentation, the following objective measures have been taken: marks on the specific activities, so that the knowledge or abilities acquired were recorded, measurement of the attendance to the experimentation, measurement of the attendance to other school activities, participation in the required tasks during the experimentation, participation in the selected subjects (mathematics, physics, ICT), marks obtained in the selected subjects (mathematics, physics, ICT), marks obtained on attitude (if available), or alternatively reports by teachers on learners' attitudes (Education and Training, 2010).

Running a pilot project in three different Countries made it difficult to agree with the meaning of *competencies acquired* that can be a subjective parameter due to the differences of curriculum adoption and teaching style of involved teachers but also to different institutional structures. A common set of Intended Learning Outcome would help greatly in order to give some freedom to each school but to be able to monitor the project as well as the student development within the educational pathway.

In order to evaluate a project instead of a standard questionnaire-based evaluation I would suggest adopting a *nominal group technique* (Ives, Skeleton and Calvert 2013) for reason regarding the method of data gathering but also the analysis.

A course rating is often based on quantitative analyses of feedback with closed-ended questions with no opportunities for free comments (Kogan and Shea 2007). Unfortunately these surveys capture the mood in a superficial level considering a student as an isolated element of the educational pathway. It also does not allow students to reflect and contextualise their thoughts about the learning project. The nominal group technique focuses more on student participation and involvement rather than staff interests. It encourages equal contribution from group members and it helps to prioritise their concerns and to negotiate the group output sharing and proposing constructive solutions. A nominal group technique can be performed in two phases as stated by Ives and al. (2013): A written questionnaire comprising a number of themed open questions and a nominal group answering to the three questions:

1. What are the strengths of the course?
2. What are the weaknesses of the course?
3. In what ways could the course be improved?

The three questions can be answered individually but then students are split in groups and they are asked to combine their answers in one sheet. Then each student is asked to rank his/her top five items relating to each of the original questions. A facilitated discussion can follow the ranking exercise and it can be recorded and transcribed (Ives, Skeleton and Calvert 2013).

## Learning Communities

According to Wells (1999) educators can transform their schools and classrooms into communities of inquirers. Employing the theoretical concept of legitimate peripheral participation, Lave and Wenger's (1991) provide a new approach to understanding how community involvement, education and social cohesion are connected. This connection has proven especially relevant in educational centres, which are attended by children from social groups at risk of exclusion and immigrant families (Buckingham 2005). It is obvious that such involvement is important not only for the involved children but also for the transformation of a community.

Communities are characterised by several aspects. In a sense we can say that a community act as an agency: they can promote a sense of belonging among their members, debate to exchange idea and opinions, support cohesion and embrace diversity (Watkins 2005). Community involvement and learning communities in schools promote academic improvements (Springer.com 2015).

## Conclusion

The socio-economic background of the three involved schools was very different. The British school offered a special curriculum intended for students at risk of exclusion, in contrast the Italian and Romanian schools followed the official curriculum of their respective countries. Although the general assessment of the experiment is positive in the three schools, the specific reasons for the positive evaluations vary considerably. In Italy and Romania, the E-motion pathway integrated naturally into the full scholarly curriculum and had influence in a variety of subjects, whereas in Britain it introduced totally new subjects because music and arts were not included in the school curriculum. As a consequence the results in Italy and Romania refer to a great improvement in school activities and curricular competencies (pedagogical techniques) and in Britain the major results refer to the attitudinal competences and the shift in the attitude towards learning (social attitudes) (Education and Training, 2010).

The main issue that come up from the report of the project is that the curriculum has not addressed any approach of inclusivity. The effect is that in the social outcome for the three Countries has not been homogeneous because of the different application methods of the same curriculum. The ability grouping adopted in UK demonstrated (as stated in the final report of the project) that:

The fact that students have been removed from mainstream education affects their relationship with the wider community as a whole. They have been moved from large educational institutions to an extremely small specialist institution with only 30 students. This affects their ability to interact with the wider peer group. (Education and Training 2010, 17)

Additionally, in order to evaluate a pilot project it is important to follow some specific criteria that take in consideration many factors and not only the performance and marks of students within the educational pathway. In this way ILOs and evaluation of effectiveness of a project will give a blurred vision without giving a starting point for a new and improved implementation but also without giving the possibility to guarantee defined learning outcomes.

E-motion project adopted few strategies in order to create a learning community encountering several issues. The utopian idea of having a unique social web platform for the whole project has been revealed not helpful because of the differences of language used in the involved schools. Additionally the platform provided was not able to integrate and follow the educational pathway and it has been not so used by the students involved in the project.

It is difficult to adopt a pure holistic approach by the institution but it is important that a curriculum plan tries to put holistic ideas into practice. A recommendation for future pilot project involving different cultures could be focussing more on the teaching environment than the structure of a learning process. In particular in the context of study, it could be a very good opportunity for students to document and create audio artefacts working in groups transforming the experience in something more and sharing a common aim. Being able to contextualise the experience using the technology and the techniques learned during the course could be a very good excuse to create working group and to enhance students portfolio in an environment where inclusivity is the common topic to know, discuss and describe. This project comes from the general idea previously expressed of trying not only to give a social provision to gain a social confidence but also to include into the curriculum aspect of inclusivity.

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