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(editors)**

**INES: An interdisciplinary and collaborative
research-action experience to integrate the
New Psychoactive Substances topic into
upper secondary school curricula**



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Foreword

Amélia Veiga, Luca Ferrari, Dana Perniu

Writing a book is never easy, especially when concluding a three-year project like INES (Innovative Teaching and Learning Paths for the Prevention of New Drug Abuse) (2021–2024). Undoubtedly, the INES Project has been a success, not only achieving what was outlined in the planning phase but also surpassing initial expectations. One main objective of the project was to integrate the topic of new psychoactive substances (NPS) into the mainstream school curriculum through close collaboration with schools and universities. Rather than treating this important subject as marginal or episodic, we created an interdisciplinary pathway that actively involves students and teachers in co-constructing the curricular proposal. This book, divided into eight chapters, is the tangible result of our work. It serves as a starting point for INES schools and other interested institutions, offering inspiration to teachers, educators, and students through concrete examples of game ideas and teaching-learning pathways. We aimed to emphasize the importance of the school's leading role within a system of continuous school-university-territory collaboration, capable of activating innovation and transformation, making all involved actors active agents of change.

This book is structured in eight chapters. Important Note! Some parts of the text have been entirely taken over and/or elaborated based on the materials published within the INES online platform, <http://ines.unibo.it>.

Chapter I presents the results of a survey conducted among teachers and students at the beginning of the INES project. The survey reveals perceptions about NPS knowledge, use, and effects; current teaching practices to address the issue; and opinions on adopting new teaching and learning strategies.

Chapter II introduces the INES Syllabus, an introductory guide to developing the teaching-learning path into the secondary schools' mainstream curriculum. It represents the starting point for creating the didactic proposal on the NPS topic.

Chapter III presents the INES Blended Learning approach. Structured as an integrated learning path, the course combines digital resources, interactive activities, and critical reflection moments, offering a modular learning experience primarily aimed at educators and students.

Chapter IV introduces the game concept and the scientific background underlying the development of a digital and interactive game platform. Based on a digital storytelling approach, this platform was designed with active collaboration with the schools and students involved in the INES project.

Chapter V presents and discusses the results of the INES experimentation. The educational experiment provided a framework for developing dynamic and responsive educational practices better suited to address the complexities of modern educational challenges, including preventing NPS abuse. The recommendations highlight organizational, technical, and didactic aspects to consider.

Chapter VI describes teachers' perceptions of the INES project experience through an autobiographical lens. The main elements of success and areas for improvement are reported.

Chapter VII shows the INES Pedagogical Planner, a toolkit for secondary school teachers who intend to design and implement interdisciplinary teaching-learning paths on NPS. This toolkit aims to support teachers in the ideation phase by providing a clear and feasible design framework and presenting examples and teaching resources based on teachers' hands-on experiences.

Chapter VIII offers theoretical, methodological, and pedagogical suggestions on concretely translating the INES experience into a curricular proposal.

This book not only marks the conclusion of a successful project but also serves as an invitation to the entire educational community to continue investing in the health of young people (health also comes through education!). It emphasizes the importance of supporting and enhancing the active involvement of students, teachers, and the broader educational community, even on particularly sensitive and complex issues.

It is with deep sadness that we remember Cristina Salca Rotaru, an extraordinary colleague, friend, and person of great humanity. Her professionalism, smile, and kindness left an indelible mark on all of us. Thank you, Cristina, for contributing to the INES project; this book will remain an important testament. May the earth be light to you.

Porto, November 2024

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INES project

Luca Ferrari, Laura Mercolini,
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INES is an imaginary name we have given to our project. INES represents any student who enters into the “tunnel” but who, thanks to the contribution of an authentic and inclusive education program promoted by his/her school context (together with other important actors), succeeds in getting out of it, by changing the course of his/her life. Therefore, INES represents a positive and powerful image of possibility, an example of success that something can really change with respect to the contrast and spread of new drugs of abuse at school. New Psychoactive Substances (NPS) represent a large and increasing group of compounds mainly of synthetic nature, characterised by pharmacological and toxicological properties particularly dangerous for the health of consumers. The emergence of NSP in recent years is a worrying phenomenon that is taking on ever more imposing dimensions: NPS have become a global phenomenon with over 110 countries and territories from all regions of the world having reported one or more NPS. Up to December 2017, more than 800 substances have been reported by governments, laboratories and partner organisations.

As underlined in the last European Drug Report (EMCDDA, 2018) the “New psychoactive substances continue to challenge public health”: [the priority is] to identify and respond to the emergence of drugs that has been lacking elsewhere”. Furthermore, it is also relevant to clearly identify the specific characteristics of the “market” where the NPS are available, and who are the target groups

(consumers) of this type of compounds. The ESPAD Report (2015) identified, for example, a growing number (3-4%) of 15-to 16-year-old school students in 24 European countries which frequently use NPS. Under this framework, INES aims to strengthen the teaching profession by developing learning content and innovative teaching methods to overcome the NPS abuse phenomenon, starting from the more vulnerable and exposed target group: secondary school students. To promote prevention and early intervention focusing on risk of new drug abuse, processes of didactic innovation in secondary education, are to be mediated by a transversal use of digital technologies.

INES project intends - within an action research approach - to create the conditions to support the collaborative networking of teachers, academic partners, and students to find, test, adapt, and use (in ordinary teaching practices) didactic strategies & resources to tackle the NPS problem. Action research is deemed to support teaching in coping with the challenges of carrying innovations reflectively while introducing NPS abuse. In this direction, INES aims to enhance the collaboration with existing networks and stakeholders, active in each partner's area, which may contribute to increasing the knowledge and awareness about the NPS topic. By doing so, INES promotes knowledge acquisition on NPS and supports the development of a variety of learning approaches, including the use of digital technologies in education, training, and learning settings and promotes collaboration to educational staff development supporting learning processes to enhance key competencies and skills of students. With the aforementioned premise that the majority of the "new consumers" of NPS come from the age group 15-16 years old, the school can certainly represent a significant context where to improve knowledge and propose effective strategies to tackle the abuse of the above-mentioned substances

The age groups reported above are included in the broadest moment of life such as adolescence, a passage that marks the detachment from childhood and preludes adulthood; therefore, we are faced with a very delicate and potentially critical moment within the growth and development path of each person (Calaprice, 2016). As underlined by Sawyer (2018), there is a need to review the "boundaries" within which this phase of life is enclosed. For various reasons, compared to the past we find today a notable influence of the world of mass media, which affects the health and well-being (psychological and physical) of people in this age group, promoting both healthy lifestyles and well-being, and behaviours that are harmful to one's health. Therefore, the idea of considering adolescence as an age that goes from 10 to 24 years is gaining ground (Ibid.).

In this direction, the school act as a catalysator for the implementation of policies and practices aimed at countering the spread of NPS (and drugs in general). An important work that requires

acting, first of all, on the knowledge of adolescents through effective and targeted strategies to promote their agency, their reflective capacity and key skills to address the problem of school dropout and to combat the abuse of NPS substances.

The INES project focuses on combating NPS by promoting processes of educational innovation that involve the “school system”, also mediated by a transversal use of digital technologies. Therefore, the INES project aims to create the conditions to support the collaboration (with alternating between virtual and non-virtual) of teachers, researchers, external stakeholders and students to find, test, adapt and (re)use (within common teaching flows) digital technologies

INES: Background

The INES project sustains the creation of Open Educational Resources, an open Handbook, and Open-Source Educational Software (game digital platform), as well as supporting teachers, students and school leaders, and other teaching professionals. The project foresees, on one side, the co-construction of Open Educational Resources (involving teachers and academic partners - e.g. academic staff and researchers) on a topic of great importance in Europe, such as New Psychoactive Substance (NPS), a large and increasing group of molecules mainly of synthetic origin, characterized by pharmacological and toxicological properties particularly dangerous for the health of consumers. On the other hand, INES promotes the design and experimentation of educational paths, valorising the teachers’ and students’ innovative role/roles to strengthen the profiles of the teaching professions and to tackle early school leaving and disadvantage. In this way, an effective combination of digital technologies (e.g. online videos, online schemes/documents, or software like Kahoot!, Quizizz, WooClap etc.), active learning strategies (using gaming, questioning, cooperative learning or peer instruction techniques etc.) and didactic contents, will be promoted within classrooms characterized by the presence of vulnerable students i.e. secondary school students. All materials produced during the project lifecycle will be released under Creative Commons licenses. This will make the INES project sustainable, allowing other teachers or trainers to use, reuse, adapt and implement the resources produced within the project in other school environments and experiences. The above-mentioned approaches and strategies, within the framework of the INES project, will be described within a digital collaborative Handbook. Importantly, the OERs created in the framework of the INES project could be used in the LifeLong Learning frame of reference, in which OERs showed great potential in diverse social, economic and cultural contexts reaching (potentially) huge audiences of disadvantaged backgrounds. By doing so, OERs potential to tackle early school leaving is seen as an effective intervention strategy to deal with new drug abuse among

secondary school students. To reduce early school leaving and disadvantages, it is essential to recognize and valorise both the so-called “student agency” which can be defined as “the power to make choices” and the development of a student’s critical capacity. Students with agency are those who feel a high level of responsibility and ownership for their learning. INES aims to strengthen the collaboration among all actors within schools, as well as with families, and other external stakeholders, by supporting didactic innovation and collaborative teaching and learning approaches on NPS topic. As recommended by OECD (2018), school curricula should be designed around students to motivate them and recognize their prior knowledge, skills, attitudes and values. Following this direction, INES will promote students’ voices (participative approaches) during the creation and adaptation of learning content, teaching strategies and games designed to face NPS diffusion at schools. The involvement of students as co-producers of learning materials and the engagement of students and teachers in the co-design of “games prototype” could be underlined as a way to boost digital skills and competencies in line with the Council Recommendations (2018) that are assumed to be crucial for personal development, employability, social inclusion and active citizenship.

INES: Results

Below, the results carry out at the end of the INES project.

- (1) The INES online platform (<https://ines.unibo.it/>), where all the results and materials generated throughout the project are made available and organized.
- (2) A survey (and research report) targeting students and teachers to assess their knowledge and interest in the topic of NPS.
- (3) The creation of a European Syllabus on the NPS topic for school education. This syllabus represents a guideline for integrating the teaching-learning paths developed during the project into the mainstream secondary school curriculum. It reflects the outcome of collaboration between researchers, teachers, and students to create an interdisciplinary didactics proposal addressing the issue of NPS in schools.
- (4) The publication of an online course on NPS, designed for teachers, students, and educators, and available on the open-source INES platform.
- (5) The design and publication of Open Educational Resources (OERs), available in the INES Pedagogical Planner, co-produced by teachers, students, and academic partners, and published under open licenses (Creative Commons).
- (6) The collaborative creation involving students of an online serious game “Paradise on the Earth”.

- (7) The publication of the INES Collaborative Handbook (ICH), a methodological resource containing all learning materials, teaching strategies, and game structures developed during the project lifecycle.
- (8) An Open-Access Publication (INES Book) presenting the project, the results of the didactic experiments, and key organizational, technical, and pedagogical recommendations for transferring the project's outcomes to other educational contexts.

Lesson Learned

The NPS topic represented a complex reality that affected a considerable number of people, including adolescents, the target group of the pedagogical and educational actions of the INES project. Schools played a crucial role in the fight against the spread and use of such substances, serving as a significant environment not only to increase awareness of the issue but also to develop effective strategies that promoted students' autonomy, their reflective capacity, and key skills to address substance abuse.

To ensure the sustainability of change and/or innovation processes within the pilot schools (Ferrari, 2017), an action-research approach was adopted, allowing the ideas, resources, and strategies developed in the INES project to be integrated into the school curriculum. Starting from the identification and recognition of current educational practices widespread in partner schools, attention was paid to improving teaching and learning, as well as the working conditions of teachers and students.

The improvement process was based, among other things, on the conscious use of digital technologies to support and enhance face-to-face activities (Adekola et al., 2017), and on a digital approach useful in promoting and supporting lifelong and life-wide learning, consistent with the lifestyles of both adults and children. The operational translation of the project's pedagogical and educational objectives passed through continuous interdisciplinary exchange among all the actors involved. Scientific knowledge on the topic was conveyed to schools through a careful selection of pedagogically sound methods and strategies. Moreover, during the collaborative work between schools and universities, the continuous exchange of feedback and information on the progress of project activities, alongside the co-construction of teaching resources, allowed for careful pedagogical and didactic monitoring of the workflow, essential for achieving the project's tasks with a high level of quality.

Chapter I. Survey on the perception of students and teachers regarding the use of NPS and teaching the NPS use prevention

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Cristina Salca Rotaru, Maria Elena Cocuz, Maria Covei

Introduction

The INES project, Innovative teaching and learning paths for the prevention of new drug abuse – INES, (project code 2021-1-IT02-KA220-SCH-000032570 – Cooperation Partnership in School Education), aims to create the conditions to support the collaborative networking of teachers, external experts, and students to find, test, adapt and use (with common teaching workflows) didactic strategies and resources to tackle the New Psychoactive Substances (NPS) problem. The project is developed under the coordination of Bologna University (Italy) and includes an European partnership comprising Porto University (Portugal), Transilvania University of Brasov (Romania), Technical and Economic Institute G. Salvemini (Italy), Mircea Cristea Technical College (Romania), Secondary School João Gonçalves Zarco (Portugal), and Swingtree company (Belgium).

In order to fulfil the project's aim, a survey (based on questionnaire) on the perception of NPS use and teaching strategies to prevent the NPS use was developed, with Transilvania University of Brasov (UTBv) as the responsible partner¹.

Survey Methodology

The survey aimed to facilitate the development of innovative teaching and learning strategies for preventing NPS abuse by assessing the perceptions of teachers and students from pilot schools regarding three key elements:

- knowledge on NPS, their use and associated effects,
- teaching and learning current practices to tackle the problem,
- new teaching and learning strategies adoption willingness and views.

Questionnaire Development and Special Approvals for Questionnaires Distribution

The survey focuses on two target groups: teachers and students from pre-university level and was based on two different questionnaires, one for each target group. The questionnaires were developed by the Transilvania University of Brasov team and improved and validated by all partners. Both target groups belong to high schools involved in the project, offering thus quite a broad view on the NPS issue (Annex I.1 and Annex I.2).

The questionnaires (for the entire partnership) were approved by the Committee for Ethics in Social and Human Research at Transilvania University of Brasov (30/08.09.2022). For the Portuguese partner, a special request was addressed, in accordance with the National Regulations (Despacho 15847/2007) and current consolidated legislation on autonomy, administration, and management of public establishments of education. No special approvals were necessary for the Italian group. The questionnaires contained a section in which consent for participation in the study was required. For students under the age of 18, a signed approval or consent of their parents was mandatory.

Questionnaire Distribution, Data Collection and Analysis

The preparation of the questionnaires followed two stages: (a) implementation in Google Forms format, with a link distributed to the high schools involved in the study; (b) translation in the native language of the partners: Portuguese, Italian, and Romanian, respectively. The distribution of

¹ The present chapter is taken and partially adapted from the Report of the INES survey (as project deliverable), published on project website <http://ines.unibo.it>

questionnaires towards the target groups was done via online communication channels (Wapp or e-mail) by representatives of each high school. No specific selection of the respondents was applied, and the participation was not mandatory. The students’ target group was formed by respondents belonging to the classes involved in the project; only the students who accepted and had the parental consent participated. Similarly, only the academic members of the schools involved in the project were asked to fill in the questionnaire.

The duration for completing the questionnaire was estimated to be 15 to 20 minutes. The questionnaires were open for completion during October–December 2022. After that, the data was downloaded and translated in English, by representatives of every project partner. The data analysis was done using the SPSS Statistic 26 software by the persons responsible from UTBv.

Questionnaire for the Students

Questionnaire Objectives

The main objective of the study was to identify the knowledge, behaviours and perceptions of the students and teaching staff related to drug (particularly NPS) use and drug (including NPS) prevention activities. The specific objectives of the study and the associated items (Q) from the questionnaire (Annex I.1) are presented in Table I.1. To be noticed that the order of the questions was not following the order of the questionnaire’s objectives, but to have an image of the level of information/ knowledge that the groups presented at the survey moment about NSP. Moreover, mixing the order of the questions/answers objectives, gave us a check key for the consistency of the answers. There were questions designed to be “control questions”, therefore their order is not simply increasing.

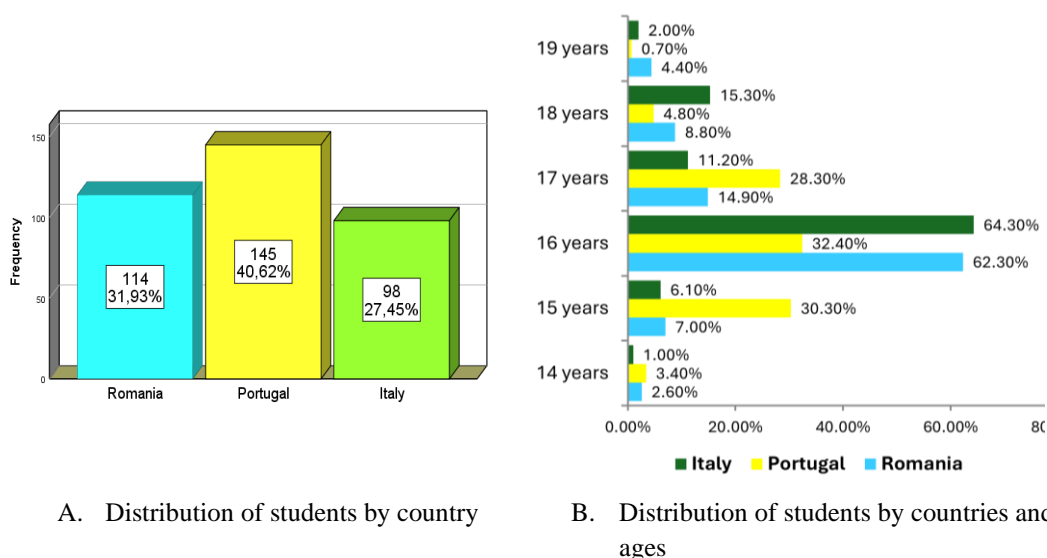
Table I.1. Specific objectives of the survey and the related questions addressed to students.

Specific objectives	Items from the questionnaire
Identify the level of knowledge regarding drug use, the associated risks with NSP use and the effects of use on the user	Q1, Q2, Q3, Q4, Q7, Q8, Q9
Identify the contexts of consuming and the factors influencing the NPS consuming	Q5, Q6
Identify the perception of the NSP consumer, as well as the NSP non-consumer profiles	Q10, Q11
Identify the students’ perceptions regarding actions used to prevent or reduce the NSP use	Q12
Identify participation and involvement in outreach activities carried out by authorized personnel in providing information about NPS, and willingness to accumulate information	Q13, Q20, Q34

Assessment of the perceived usefulness of activities regarding drug information with regard to the methods used to present the information at school, and the presentations frequency	Q14, Q15, Q16, Q17, Q18, Q19
Identify preferred ways of the students of finding out about NPS and knowledge about which institutions are trusted to provide said information	Q21, Q22, Q26, Q27, Q28, Q29
Identify structures that could provide support to prevent and/ or reduce NSP use	Q23
Identify the willingness of the students to get involved in collaborative activities, as creating and distributing information materials on NSP	Q24, Q25
Identify the preferred ways of the students to play games and where they prefer to play	Q30, Q31
Identify media sources that have had an impact on students because the portrayed characters used NPS	Q32, Q33

Student Responses Analysis

The first target group was formed by 357 students from the high schools involved in the partnership, distributed according to Figure I.1.



A. Distribution of students by country

B. Distribution of students by countries and ages

Figure I.1. Distribution of the participating students by countries (A) and age (B).

The Level of Knowledge of the Students Regarding NPS and NPS Use

The majority of students agree that their knowledge of NPS is insufficient (Q1), although they are sufficiently aware of the dangers of using NPS (Q2). However, the Italian students declared they were well-informed.

The majority of students identified hallucinations, aggressive behaviour, a shorter attention span, a high sense of relaxation, and headaches as some of the symptoms linked to the usage of the NPS (Q3). In keeping with the earlier responses on the lack of awareness or low level, a significant

number of students (129), the majority of whom were from Portugal and Romania, stated that they were unaware of any consequences of using NPS.

Considering the negative impact of NPS use (Q4), the descending order of the impacts is: health of the NPS user, family relations, school performance, friendships, relations among classmates, others. No major differences among students coming from different countries were registered. Related to the level of impact that NPS use has on the behaviour or the body of the user (Q7 and Q8), the students mentioned (selection):

- satisfying the curiosity, with little impact;
- higher inclusion in the group of friends, classmates, or acquaintances, with a higher level of impact (Italian students consider a high level of impact, and the others are almost equally distributed between “a lot “and “a little” impact);
- the well-being as being impactful; the level of impact (completely - a lot – a little) has a quite similar distribution; a significant number of Romanian students declared that they don’t know about the issue;
- the health is perceived differently as being affected; most students from Italy declare it as not being affected at all, while the students from Portugal consider health as being completely affected; most of the students from Romania consider health as not being affected at all, but quite a significant number declare that they don’t know how to assess it;
- the school performance is considered to be strongly decreased by the use of NPS; there are students that don’t know about it, while others (most of them from Portugal) consider a strong increase in school performance associated with NPS use;
- the self-esteem and self-confidence are perceived as being affected, but there is not a visible tendency;
- the family relationships are mostly perceived as being strongly negatively affected by most of the students;
- the appreciation in the group of friends is negatively affected in the vision of most of the Romanian students and quite enhanced (increased) in the vision of the Italian students.

Considering the addiction to NPS (Q9), most of the students perceive it as being “somewhat” or “not at all” controlled by the user.

We may conclude from the examination of student responses to questions about their understanding of how NPS use impacts the user's behaviour, relationships, and performance that

students require more precise and trustworthy information on the topic. Some of them are knowledgeable; the Italian students appear to know more than the others.

Contexts in which NPS are Consumed and the Factors Affecting the NPS Consumption

It is known that people learn more easily if they are faced with familiar situations. Thus, the question related to NPS consumption context was designed to find out the students' perception of the issue (Q5). If the educational situations related to NPS use prevention are based on contexts that are perceived as consumption situations, the educational message should have a high impact.

The students mentioned the following consumption contexts (descending order of the number of choices): in clubs, at parties, in neighbourhoods, at music festivals and concerts, in bars, at friends' houses, in parks, at home, in quiet areas, at schools and in recreational areas.

From the scientific literature and from official reports, reasons for NPS use were depicted, and students' perception of these reasons was investigated (Q6), as presented in Table I.2 and Table I.3. Overall, the respondents recognised (generally in a prudent manner) the use of NPS as most probably influencing different factors such as: coping with bad feelings, improving leisure moments (fun, entertainment, parties, etc.), enhancing the self-perception, or enhancing sociability. Most of the students perceive the use of NPS as "never" or lowly influencing the individual performance enhancement and ability for focusing on studies, but "often" or "partially" providing energy to the users.

Table I.2. Students' perception on the reasons for NPS consumption: most of the answers distributed by country.

Reasons for NPS consumption	Italian students	Portuguese students	Romanian students
to forget the worries, problems	always	often	never
to cheer up when they are in a bad mood	often	partially	always
help to pass through depression and anxiety	often	often	never
boredom prevention help with passing time	partially	partially	partially
the pleasure of consumption	always	often	partially/ often
having fun	partially	partially	partially
entertaining, making him/her feel good	always	often	always

Table I.3. The most often chosen answers by the students on their perception on the reasons for NPS consumption.

Reasons for NPS consumption	Most often chosen answers
making the subject more sociable	partially, never
social gatherings	partially
parties and celebrations	often
feeling of self-confidence	often, partially

to be liked	partially
to fit in the group	often
for not being left out from the group	often
consumer's intention to know himself/herself better	partially, never
creativity enhancement	partially, never
causing things to be understood differently	partially
more open to experiences	partially
improve the user's performance	never
learning or concentration enhancement	never
providing more energy	partially/ often

The Perception of NPS Consumer's Profile

Most people have a cliché representation of the NPS consumer profile, and their presence has been investigated in this context. The questionnaire contains two items focusing on this issue: Q10 and Q11. NPS consumers are described by most of the students through negative attributes such as "irresponsible", "easily influenced", "emotionally unstable" or "addicted". The person who refuses the use of NPS has a positive perception from most students: "responsible", "mature", "strong", "resists peer pressure", "someone who is able to anticipate the aftermath of drug use".

Educational Actions for NPS Use Prevention

In the view of the majority of respondents, the main actions/ knowledge that could lead to the prevention or reduced use of NPS are (Q12): "Receiving information and knowledge regarding the negative effects of NPS consumption on the health of the user", "Receiving information and knowledge about NPS", "Requesting help and support". The students appreciated the informative sessions proposed by the questionnaire, demonstrating their willingness to gain new, more, and better knowledge.

Students' Involvement in Educative Actions for NPS Use Prevention

In order to get a general image regarding the willingness of the students to be involved in preventive actions and the manner in which they see their involvement, questions Q13, Q20, and Q34 investigated the type of activities they can perform as well as their willingness to receive new information.

Considering the participation of the students in activities focusing on drug use prevention (Q13), done by an authorised staff, the answers are different when it comes to countries: most of the Italian students participated in such events; most of the Portuguese students did not participate, while the answers of the Romanian ones are almost equally distributed. The involvement of the students in actions regarding drug use prevention is mostly declared "passive" (listening and trying to understand what is important) by most of the Italian and Romanian students.

The question related to the willingness of the students to learn about NPS proved that most students would like to learn about NPS. But, in a significant percent, there are students (~30% from Romania, ~ 22% from Italy and ~ 15% from Portugal) who declared a lack of interest.

Perceived Utility of the Informative Sessions

In order to understand the perception of the students for the utility of the educational sessions, the questionnaire proposed items related to the usefulness of drug use prevention sessions, the approach of the NPS subject, the manner of presentation, and their frequency (Q14, Q15, Q16, Q17, Q18, Q19).

The answers of the students to the question related to the perceived usefulness of drug use prevention activity show a very good appreciation by most of the Italian students and the lack of participation in such activities by most of the Portuguese students. The respondents for Romania do not have a predominant opinion some of them did not participate in prevention activities, and from those who participated, some considered them as being “very useful” and some as “somewhat useful”.

Considering the subjects approached during the drug prevention activities, most of the Italian and Romanian students remembered that NPS were discussed. From the Portuguese respondents, most of them did not participate in such actions; part of them do not remember, and a few declared that NPS were discussed.

Most of the students that participated in drug use prevention activities appreciated the approach of the topic, the presentation containing the following strategies (in descending order of their quotation): Free discussion on the topic of drug use, Video presentation about drugs and their effects on the user, Oral presentation supported by PowerPoint slides (ppt), Video presentation about drugs and their effects on the user, as well as discussions based on the video, Building and analysing possible scenarios about drug use and their effects, Videogames, Games.

Considering the open items, the students proposed preferred ways of presenting information regarding drug prevention activities (in order of frequency of occurrence): testimonies; free discussions about experiences with drugs and drug effects, discussions with experienced people such as police, customs officers, medical doctors, and scientists, meeting experts like police officers or former addicts, videos, debates, discussions with colleagues/teachers at school, lessons, special courses and PowerPoint presentations and documentaries in order to find out more information. It can be seen that the main ways of information presentation desired by students were not used in the activities the students took part in.

The drug abuse prevention activities were well assessed (efficient and somewhat efficient) by the respondents who took part in such activities. The students were asked about the integration of this type of activity in the school’s curricula. Most of the Portuguese students declared that there were no specific activities. Most of the Italian students declared episodic actions, while the Romanian ones declared both no specific actions and episodic ones.

Students’ Preferred Ways of Presentation During Informative Sessions

The students were asked to specify the preferred ways of presentation during the informative sessions about NPS (Q21, Q22, Q26, Q27, Q28, Q29). Some of the questions were open, and the students filled them in by using their own words.

To the question focusing on preferred ways to learn more about NPS in schools (open question), the answers of the students were (in descending order of their occurrence): discussions about the consequences of consuming NSP; testimonies; online discussions; activities regarding the use of NSP, anti-drug; PowerPoint presentations; presentations of real cases; video games; drug tests; posters; events; movies; solutions to drug addiction; documentation; text messages. For instance, the Romanian students mentioned “Online Two hours should be introduced in the timetable to talk and learn about NPS”; the Italian students indicated a course/ discipline "Health and Responsibility"; the expressed their interest in “Videos” and “Gaming”. Table I.4 synthetically presents the most frequently mentioned methods of learning more about NPS, as reported by various student groups. Relevant and accurate information is needed, when informing about NPS. The question related to the perception about the trustworthy people/ institutions/ sources when informing about NPS (Q23), the students ranked in the first place the specialists from different institutions/ associations, followed by teachers and family members. Examples of answers from the different groups of students are presented in Table I.4 (sections B and C).

Table I.4. Mostly mentioned ways to learn more about NPS and trustworthy experts involved in prevention activities.

Survey item	Italian students’ answers	Portuguese students’ answers	Romanian students’ answers
A. preferred ways to learn more about NPS	discussions with doctors, scientists, policemen, customs officers, or with former addicted persons	awareness-raising action	discussions with specialists, experts, researchers and policemen
B. trustworthy experts involved in prevention activities	witnesses, teacher/ educators working in your school or from other schools	policemen, teacher/ educators working in your school, representatives of the Ministry of Health	representatives of the Ministry of Health, teachers/ educators from other schools, scientists

C. structures for NPS use prevention	specialized institutions or associations, psychologists/ therapists, family members
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Considering the preferred didactic approaches, most of the students appreciate “Practical cases and testimonies”, and “Group work (e.g., development of information materials using digital technologies and online communication tools)” and “Development of digital educational proposals and resources that need my active participation (and not only receptor of information)”.

Since the INES project focuses on gamification as a teaching strategy, the opinion of the students regarding it was assessed. Most of the responding students enjoy playing games; only a very small number of them don’t like or don’t have an opinion. There are no significant differences between the types of games they play: face-to-face or online. Table I.5 presents the frequency of the students’ responses about playing games. Considering the games, most of the students from Italy prefer offline, team games like football, followed by online, Minecraft, FIFA, Uno, Rocket League, Bo, those from Portugal prefer team games, card games and Monopoly and online FIFA, and those from Romania online Minecraft, football (offline), followed by online CS:GO, FIFA, Overwatch, Sims.

Table I.5. Frequency of the students’ responses about playing games.

Frequency of responses	Italian students	Portuguese students	Romanian students
different games (listed above)	10	52	53
I'm not playing	16	10	8
I don't know	14	12	2
No answer	74	71	35

*Note: the students could choose multiple answers.

The Willingness of the Students to Involve themselves in Collaborative Activities, in Development and Distribution to Support the NPS Use Prevention/Reduction

The answers of the students to questions Q24, Q25 prove their openness to be involved in educational activities. While most of the students responded positively, some expressed a lack of involvement in this type of activity. This might be correlated with the low level of information that has been assessed in previous questions.

Places where Students Prefer to Play

Two of the questions (Q30 and Q31) assess the context in which students prefer to play. Regardless of their country of origin, they prefer to play first with friends, second alone, and third with "classmates" (Italian students and Romanian ones) and "family members" (Portuguese students). Considering the place where they play, most of the students prefer playing “At home”, followed by

„At a friend’s/classmate’s house”, and on the third place „In the park”, (the Italian students) „In school” (the Portuguese students) and „At parties” (Romanian students).

The Movies/characters were NPS Consumption Impacted the Students

Two open questions, Q32 (What movies/ series where characters use NPS have made an impact on you?) and Q33 (What books, where characters use NPS, have impressed you?) were designated to gather information about how the students develop their representations of NPS use based on movies they watched and the books they read. Table 1.6 and Table 1.7 present the students’ responses for the two questions (Q32 and Q33, respectively), with a distribution of their answers on groups of students.

Table 1.6. Distribution of answers, on groups of students, to question Q32: What movies/ series where characters use NPS have made an impact on you?

Frequency of responses	Italian students	Portuguese students	Romanian students
different movies/ series (listed below)	21	57	
no movies		8	49
I don’t know	37	54	45
no answer	56	26	4

*Note: the students could choose multiple answers.

Table 1.7. Distribution of answers, on groups of students, to question Q33: What books, where characters use NPS, have impressed you?

Frequency of responses	Italian students	Portuguese students	Romanian students
different books (listed below)	3	13	1
I don’t read	80	100	70
I don’t know	6	6	26
no answer	25	26	1

*Note: the students could choose multiple answers.

Considering the question focusing on movies/ series where characters use NPS that have made an impact on the students, most of the Italian students appreciate “Nobody”, the Romanian and Portuguese students appreciate the series “Euphoria”, followed by “Elite” and “Breaking bad” with equal scores for the Portuguese students and „Beautiful boy”. The Romanian students mentioned “Jeffrey Dahmer” and, with an equal score “Jesse Pinkman from Breaking Bad”, “Eyes wide shut”, “Requiem for a Dream”, “Fear and Loathing in Las Vegas” and “The umbrella academy”.

There were mentions of a few titles of books where characters use NPS, which have impressed the students: “A room full of people”, “The days of drugs”, “We, the guys from the Berlin Zoo”, “Good girls”, “Bad blood”, “Rocco academy”, “Love me”, Love me (book) character, “James in Italy”, “The Children of Drugs”, “Joana’s Alua”, “An adventure”, “The Obedience Drug”, “The Exorcism of My

Best Friend”, “I already told you that I love you”, “Requiem for a dream”, “Diary of a Wimpy Kid”, “The bunny hole”, “Dune saga”, “It's ends with us”, “Eminem”, “Paul”, “Marius”, “The lady disappeared”, “Thousands of sensations”, “Dependence” written by Constantin Crinu, and “Love letters for the departed”.

Unlike the films, where “Euphoria” was mentioned by students from two countries, in the case of the books they are totally different. In this question, the answers “I don't read” and “I don't know” stand out, which means that students do not prefer reading books.

Concluding Remarks for Students’ Questionnaire

The survey examining students’ perceptions of NPS use was founded on a questionnaire of 35 questions. The target group consisted of students from high schools participating in the INES project.

The questions were designed to fulfil the survey’s aim to support the development of innovative teaching and learning paths of NPS abuse by finding out the perception of the students and their opinions regarding the knowledge of NPS, their use and associated risks and effects, the current teaching and learning practices used to tackle the problem, the new teaching and learning strategies adoption willingness, as well as their views.

The majority of students stated that they possess a certain level of knowledge about NPS and associated risks, but there are still students who declared that they have a lack of information. The Italian students seem to be more informed than the Portuguese and Romanian ones. Hallucinations, aggressive behaviour, a shortened attention span, a strong feeling of relaxation, and headaches are recognised as mostly being caused by the use of NPS. The health of the NPS user, family relations, school performance, friendships, and relations among classmates are mentioned as being negatively impacted by the use of NPS. The impact of NPS use on users’ school performance, self-esteem/self-confidence, family relationships, and appreciation within the group of friends were recognised as being affected by the use of NPS. Considering the addiction to NPS, most of the students perceive it as being somewhat or not at all controlled by the user. There are differences between the answers of the students, as there rarely was a general or common trend.

When qualitatively assessing the students’ level of knowledge related to NPS use and its effects on the consumer’s body, relations, and performance, it can be concluded that students have some knowledge, but there are differences among countries, since Italian students seem to be more informed than the others. Thus, the INES project is welcomed, and in the frame of the project, students should be faced with more accurate information about the topic.

Considering the consumption contexts, the students most frequently mentioned clubs, parties, neighbourhoods, music festivals, and concerts.

The respondents recognised (generally in a prudent manner) the use of NPS as most probably influencing different factors such as: coping with bad feelings, improving leisure moments (fun, entertainment, parties, etc.), enhancing self-perception, and enhancing sociability. Most of the students perceive the use of NPS as “never” or lowly influencing the individual performance enhancement and ability for focusing on studies but “often” or “partially” providing energy to the user.

Asked about the perceived characteristics of the NPS consumer’s profile, the majority of the students used negative attributes, since for the people refusing NPS, most of the respondents used positive attributes. Following the analysis of students' perceptions of drug users, it can be stated that they are negatively discriminated against because they are perceived negatively, choosing answers that characterise them as "irresponsible", "easily influenced", "emotionally unstable", "dependent". The non-drug users are positively discriminated against because they are perceived positively, choosing answers that characterize them as “responsible”, “mature”, “strong, resists peer pressure”, “Someone who is able to anticipate the aftermath of drug use”.

The students appreciate the informative sessions proposed by the questionnaire, demonstrating their willingness to gain new/more/deeper knowledge leading to NPS use reduction and/or NPS use prevention. While most of the students are willing to participate in informative sessions, a significant number of students expressed a lack of interest in such actions.

The analysis indicates that students in Portugal experienced significantly lower contact with informational activities conducted by authorized personnel (teachers, specialists, authorities, etc.) related to drug prevention, in contrast to their colleagues in Italy, who received information at a considerably higher percentage. No statistically significant differences exist between informed and uninformed Romanian students. Consequently, Portuguese students want to be informed about NPS to a much greater extent; this is due to the low level of information compared to Italian and Romanian ones.

Italian students exhibit a higher preference for “active” activities, which may be correlated with the perception of the drug prevention initiative as being “somewhat efficient”. In contrast, the Romanian and Portuguese students considered actions in their schools as “not effective at all” as they were mostly based on “passive” methods of presentation.

Therefore, there were significantly more discussions regarding NPS focused on prevention of consumption in Italy and less in Romania. This fact may increase the rate of NPS consumption in the absence of information regarding their impact and effects. For students in Portugal, the lowest level of information was recorded in the absence of NPS prevention activities.

It is possible that the low effectiveness of the presentations is due to the methods used, which are not adapted to the preferences of the students. From this survey it appears that the preferred ways of presenting information to the students are mainly: testimonies; discussions about experiences with drugs, and their effects (police, customs officers, doctors, scientists), meeting experts like police officers or with former addicts; videos; debates, discussions with colleagues/teachers at school; lessons, special courses and PowerPoint presentations to find out more information as well as documentaries. From the analysis, it can be stated that the predisposition to participate/be involved in the creation and distribution of informational materials on NPS might be increased if the level of knowledge of the students increases.

An important aspect is the willingness of students to collaborate with teachers in the preparation of materials needed to prevent/ reduce drug use, which means that they are not indifferent to the phenomenon of drug use but are aware of its seriousness and therefore choose to be involved and supportive, demonstrating civic spirit through the desire to get involved.

Questionnaire For the Teachers

Questionnaire Objectives

The objective of the questionnaire addressed to teachers was to find out their knowledge on NPS use, the associated effects, and mainly to depict a picture of the current teaching strategies and the willingness to adopt new, collaborative strategies. The specific objectives of the study and the associated items from the questionnaire (Annex I.2) are presented in Table I.8.

Table I.8. Specific objectives of the survey and the related questions addressed to teachers.

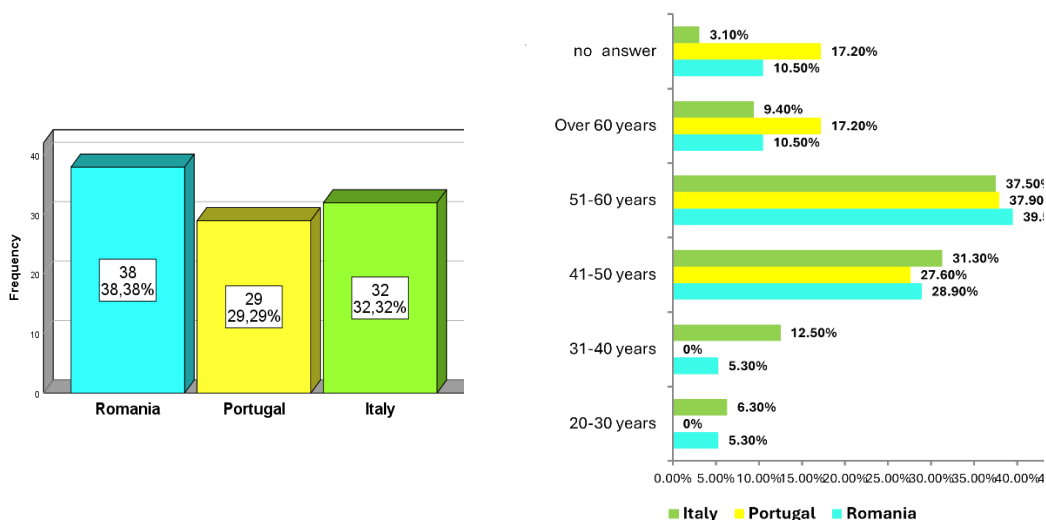
Specific objectives	Items from questionnaire
Identify the level of knowledge about drug use, risks associated with NPS use, effects of NPS use on the user, and the users' capacity to control the addiction	Q1, Q2, Q5, Q8, Q9, Q16
Identify the contexts of NPS consumption, from the perspective of the teachers	Q6, Q7
Identify the perception of the teachers regarding students in need of support on difficult problems and their availability for support	Q10, Q11
Identify the challenges faced by the teachers in addressing the NPS subject	Q31, Q32
Identify the level of participation in informative sessions on NPS organized by authorized staff	Q12, Q30

Develop a general picture on current teaching practices related to NPS prevention subjects	Q13, Q14, Q17, Q18, Q19
Identify the need of new information and information sources used by teachers in documentation on NPS	Q3, Q4, Q24
Identify the teachers' willingness of contribution in educational collaborative materials development dedicated to NPS use prevention	Q15, Q20, Q26, Q28, Q29
Identify the preferred teaching approaches to be used in NPS use prevention activities	Q21, Q22, Q23, Q27
Identify the teachers' opinion regarding the opportunity of NPS subject introduction in school curriculum	Q25

*Note: there were questions designed to be "control questions", therefore their order is not simply increasing.

Teachers' Responses Analysis

The second target group was formed by 99 teachers, from partner schools, according to Figure I.2.



A. Distribution of teachers by country

B. Distribution of teachers by countries and age

Figure I.2. Distribution of the participating teachers by countries (A) and ages (B).

The distribution of respondents indicates a balanced representation across countries, with a majority being experienced educators.

Level of Knowledge on NPS

Teachers were requested to self-assess their own level of knowledge on NPS. The responses suggested that most of them perceive themselves as well informed regarding the general topic of drugs and their effects (Q1), but less on the NPS (Q2). The responses to the question related to NPS approach during drug use prevention sessions (Q16) are varied, lacking a discernible trend. Despite teachers' self-assessment indicating a low level of knowledge on NPS, they are perceived as being

very harmful (Q5). In relation to the addiction (Q8), most of the Romanian teachers declared they cannot talk about the issues, which can be attributed to the limited knowledge on the topic. The answers coming from Italian and Portuguese teachers are quite distributed, indicating a generally reduced level of information regarding the topic. The addiction is perceived as being in a very low degree controlled by the user (Q9). A considerable proportion of Romanian teachers reported uncertainty regarding the extent of addiction control possessed by the user. The conclusion on this issue is that the teachers have some information about NPS, which was acquired in some cases from specific preventive actions, but the need of coherent information about NPS, their use as well as addiction and addiction control is very necessary.

Contexts of NPS Consumption

To get an understanding of the big picture of NPS use, the questions related to the NPS consuming contexts (Q6, Q7) provide insights. Most of the teachers (with no relevant differences between countries) considered as consumption contexts parties, clubs and bars, music festivals, and concerts. Related to the perceived reasons for NPS consumption, teachers considered that curiosity, the wish of experimentation, and group relations (the wish to fit in the group, imitation of behaviours) are the main reasons for NPS consumption.

Willingness of the Teachers to Offer Support

Teachers may offer support to students when they find themselves in difficult situations, but the issue is different in the participating countries, most probably due to different approaches to the counselling activities in educational systems. Thus, most of the Italian and Portuguese teachers have not been approached by students for support in difficult situations, while in the case of Romanian teachers, almost half of them declared their support (Q10). However, most of the teachers expressed their willingness to assist their students upon request (Q11).

Challenges Related to NPS Subject Approach

Two open questions (Q31 and Q32) were addressed to find out challenges perceived by teachers in addressing the NPS subject and the tables below show the answers. It can be noticed that in different forms, the need for knowledge and information on the subject is mentioned in order to provide students with relevant, accurate, and adequate information (Table I.9 and Table I.10). The teachers have listed examples of useful topics and methods in teaching about NPS, as follows:

Italian teachers: dialogue with pupils; relational issues; analysis of data and side effects; video; indifference; I would like some taboos to fall; generational gap, reflection on the values that are harmed by NSPs; need for uniformity and scientific answers to spontaneous

questions from students on the topic of substance use; possibility to provide reliable suggestions for consultation of sources; make it clear that school is also an opportunity to combat the use of drugs of any kind; addiction; early school leaving; poor knowledge; use of soft drugs; privacy on experiences for topic delicacy; peer to peer education.

Portuguese teachers: inform and sensitize about use NPS; harms of its use NPS; what are the signs? how to help?; dependencies; study case and information about NPS; lack of training; distrust/ fear of parents; the causes that lead to consumption and the consequences of consumption the NPS; effects on the central nervous system; how to approach these themes in a way that students may participate without feeling forced/ uncomfortable; the sensitivity of the matters; on one hand they are real but on the other hand they stimulate the curiosity; at citizenship subject these topics should be addressed; deconstruct prejudices about the usage of NPS and its consequences; give adequate information keeping in mind the students age; the consequences on human health of the usage of NPS; difficulty on levelling information according to the student's age.

Romanian teachers: testimonies of students that experienced this at a young age, workshops; interactive games to show the consequences of NPS consumption on the human body; bullying, smoking; ways to avoid the NPS temptation; not knowing the consequences; consumers of NPSs are not considered at risk.

Table I.9. Distribution of answers, for the groups of teachers, to question Q31: *What means of teaching about NPS to students, do you consider the most appropriate?*

Frequency of responses	Italian teachers	Portuguese teachers	Romanian teachers
different means (listed below)	1	10	1
I don't know	15	7	3
no answer	22	12	28

*Note: the teachers could choose multiple answers.

Table I.10. Distribution of answers, on groups of teachers, to question Q32: *What do you consider to be useful in a training activity for teaching staff focusing on the topic of NPS (ideas, suggestions)?*

Frequency of responses	Italian teachers	Portuguese teachers	Romanian teachers
different means (listed below)	5	16	25
I don't know	7	4	4
no answer	26	9	3

*Note: the teachers could choose multiple answers.

The following are some examples of useful training activities that teachers have listed:

Italian teachers: testimonies; be well informed; know how to talk about it correctly with pupils; scientific basis, method of approach, constant support; meetings; identify strategies that help children to trust and to open up to their teachers; talk freely and without hypocrisy about the delicate topic; basic.

Portuguese teachers: obtain information about NPS, the signs and about how to prevent the consumption of these substances; ways of intervention/ help; Mini workshops; adequate approach methods and discussion techniques with students complemented with a scientific information; clear speech with precise information; webinars; learning, discussion and spreading methods; disseminating; lectures.

Romanian teachers: Information/ Current information about the substances consumed by young people, about how they reach students, their effects; Informative materials; Testimonies; Discussions, debates, lectures by specialists; Case studies; Studying concrete examples; Concise and attractive presentation; Training; Motivating students to participate in activities; role play; Concrete methods by which I can determine a student to give up consumption or not to be tempted to consume.

Teachers' Participation in Informative actions on NPS use prevention

Many of the teachers took part in activities regarding drug use prevention provided by authorized personnel (Q12): most of the Italian and Romanian teachers, but less than half of the Portuguese ones. When asked about training in the field (Q30), most of them declared that they have not taken part in such activities, excepting the Romanian group – most of them (more than a half) who declared that they were trained in the field.

Current Teaching Practices Related to NPS Use Prevention Activities

The drug use prevention activities in Portuguese and Romanian schools are episodic (1-2 per year), while in the Italian ones they are part of the curriculum (Q14). Considering the drug prevention initiatives in the schools they belong to, many of the Portuguese teachers cannot assess the efficiency and usefulness since many of them declared that they have not taken part in such type of activities (Q13, Q17). The Romanian teachers consider them efficient, and the Italian ones consider the activities somewhat efficient, very useful, and somewhat useful. The topic approach, for those who participated in drug use prevention activities, was enjoyable (Q18). Most of the interventions were based on presentations (PowerPoint, video), correlated with discussions and/or free discussions regarding the topic. Some of the Italian teachers mentioned the video games that were used in such activities.

Thus, the informative sessions on drug use prevention are episodic in Portuguese and Romanian schools and part of the curriculum in the Italian schools. Some of the teachers participated in such activities, those who participated considering this type of intervention to be efficient and somewhat useful. Taking into consideration the presentations, the PowerPoint and video ones were reported as being in the majority. Only a small number of teachers, primarily from Italy, reported video games as being used in drug use prevention activities (Q19).

Information Sources for Teachers

At question (Q24), related to the need for new information on the NPS subject, teachers' answers proved their interest in the topics proposed in the frame of the INES project: Effects of NPS use, Types of NPS, Diffusion channels of NPS, Information sources about NPS, Means of consumption of NPS, Media representation of NPS and NPS users. Considering the information sources used by teachers to get information on NPS, mass media, scientific literature, and dedicated training activities are those declared as being used by most of the teachers (Q3). The answers focusing on trusted sources of information (Q4) almost fall in the same categories: scientific literature, specialists from different institutions/associations, dedicated programs in schools, mass media which has recorded a low level of trust. The conclusion is that teachers are interested and need information on the NPS topic, coming from scientific literature and specialized institutions.

Teachers' Willingness to Involve in Educational Materials Development

Given that one of the objectives of the INES project is to develop teaching materials on NPS use prevention, the survey intended to get a view on teachers' willingness to be involved in such activities. Starting with their participation in previous prevention activities (which was quite low for the Portuguese teachers) and the passive involvement (for the majority of the respondents), based on listening to and understanding the discussions regarding the topic presented by specialized personnel (Q15), it can be inferred that teachers have a sort of "inertia". A substantial number of respondents indicated uncertainty or negative responses regarding teachers' willingness to engage in NPS prevention activities and the development of teaching materials. Beyond these answers, most of the teachers are "interested" and "somewhat interested" in collaborating with colleagues in developing open educational resources (Q20), willing to participate in activities intended to create teaching aids (Q26) and have a high degree of willingness to be involved in teaching about NPS to students (Q28). The content creation specifically dedicated to teaching the NPS topic (Q29) is an activity that got prudent responses: "I don't know", "low" and "very low" were selected in quite a significant number. Around 30% of respondents declared their willingness to participate in content creation.

Preferred Teaching Approaches in Learning About NPS

Teachers were asked about their preferences in learning more about NPS use prevention via an open question (Q21) and responses are presented in Table I.11. Many of the answers fall in the category of “interactive”, dynamic activities, testimonials, videos, brainstorming, debates, problem-based working groups, etc. A significant number of responses, with a minimal occurrence of “I don’t know”, indicate that teachers seek further information on the topic.

Table I.11. Distribution of answers, on groups of teachers, to question Q21: How would you like to learn more about NPS use prevention? Please write down below your preferred means of learning.

Frequency of responses	Italian teachers	Portuguese teachers	Romanian teachers
different means (listed below)	33	6	30
I don't know	1	9	2
no answer	4	14	0

The different groups of teachers exemplified their preferred means of learning about NPS use prevention, such as:

Italian teachers: conferences, meetings, testimonies from specialists who work in the field of recovery/ addressing the topic with the support of specialist doctors and experts; personal testimonials, slides, videos showing the effects (both "soft" and more "rough" videos), possible group activities/ discussions (if the right conditions are met); read specialized articles, videos, debates; theoretical lessons, face-to-face; addressing the topic with the support of specialist doctors and experts; with interactive digital activities, and with projects where students have to create a product to present and share at least with the school community; handbook (which is what I have been offered up to now); seminars; newspapers; focus group; cooperative learning activities; sources already indicated; training; know effects and production; know distribution and reference data; concrete educational proposals and indications on how and where to find correct information to keep up-to-date, being a constantly evolving field; any functional method for identifying and solving the problem in children, not necessarily a medical-theoretical;

Portuguese teachers: videos, podcasts, digital materials, interactive actions, availability of videos, infographics and other materials, case study and roleplaying games, Interactive, dynamic, brainstorming, active methodologies; gamification; blended learning; projects, testimonies, lecture by experts on the use of NPS, speeches, informative lectures taken to the school, participate in problem-based working groups, online session, scientific reports, internet, conferences, webinars, seminars, face-to-face training with case studies.

Romanian teachers: meetings/ seminars/ interactive information on drug prevention measures; specific informative materials created by the Ministry of Education, uniform for the entire educational system, written, video, guides, case studies, articles, books; testimonials in school (of former users); collaboration with doctors/ drug police officers/ specific activities supported by specialists; video presentation, online course, oral presentation, Power Point; specialized programs/ specific activities; games/ video games; activities organized in the school; through an online platform; mail, information within the school, courses.

Most of the answers for the question addressed to the didactic approaches preferred for NPS use prevention activities (Q22), mention the “practical cases and testimonies” and „video presentation about drugs and their effects on the user, as well as discussions based on it”. Watching a movie is perceived as having a positive effect on prevention/ reduction/ ending the use of NPS (Q23).

Teaching the NPS subject to students is perceived as being appropriately done by using interactive methods (Q27), mainly based on testimonies, debates and interactive discussions, videos, group work. The answers for the open question (Q27) are presented in Table I.12.

Table I.12. Distribution of answers, on groups of teachers, to question Q27: *What means of teaching about NPS to students, do you consider as being the most appropriate?*

Frequency of responses	Italian teachers	Portuguese teachers	Romanian teachers
different means (listed below)	36	14	28
I don't know	2	2	1
no answer	0	13	3

Examples of the perceived most appropriate means of teaching the subject of NPS, considered by different groups of teachers:

Italian teachers: direct testimonies; videos; Interactive discussions; group work/ teamwork; practical activities; free debate; explanatory PowerPoint presentations; information given by specialists; laboratory activities that involve an output from students, that can be reused; in the future; communication, dialogue with experts, illustration real cases of known characters; scientific material.

Portuguese teachers: debates; videos presentation; PowerPoint presentation; real testimonies; games; participation of students from the groups (age groups); videos and further discussion/ debates; active methodologies (gamification, blended learning, projects); work in group, presentations and debates; work on self-concept, critical thinking

and decision-making skills; analyse and discuss real scenarios about people that used to consume or still consumes; NPS presentation and discussion of real scenarios and about the consequences on using NPS; talk about its damage; search; expository method; case study, role-playing games (which can be digital); digital tools, scientific posters when approaching the topic “Our Brain” or at “World Health Day”; after information given creation of discussion groups; digital or non-digital representation games; research on the matter; watching a video and the open group debate ; approach and free discussion; discussion on how harmful they are.

Romanian teachers: games; debates, Ppt presentation; videos; movies; interactive activities; real testimonies; research on the matter; curriculum; digital actives; study the case; presentation and discussion of real scenarios and about the consequences on using NPS; analyse and discuss real scenarios, about people that used to consume or still consume NPS; debates with digital support; approach and free discussion; open lessons.

Opportunity of NPS Subject Introduction in School Curriculum

Most of the teachers consider the NPS topic as being an appropriate subject in the school curriculum. It is important to mention the significant number of teachers (in the range of 30-40%) that do not know the appropriateness of the introduction of such a subject in the school curriculum (Q25).

Further Ideas

Teachers were asked, via an open item, to provide extra information (Q33): *Please add any further ideas or observations regarding the topic of NPS.* The importance of the subject was mentioned, but with paying close attention in order to not stimulate curiosity in students, the use of testimonials and the involvement of experts. A selection of the teachers’ suggestions is given below.

Italian teachers:

- direct confrontation with those who were able to get out;
- hear experts and people who have made use of it, especially if very young; hypothesis of inclusion in the curriculum of Civic Education; videos and testimonials; work on what drags a young person into the use of NPS would be important;
- using video games can be a correct approach because it is stimulating; law enforcement or legal intervention regarding the consequences of the use and distribution; it is important that they understand that they are not presented/ said/ told these things “Because we want them good and good”; but because it is at stake their lives and that of others; knowledge of the phenomenon, substances, effects, the average age of use of the NPS;

- teenagers, on a personal level, for issues regarding their generation and the factors that go “in fashion”; prefer to interact with their little “more mature”; peers; also be useful to meet with drug use specialists to understand what approach to use in dealing with boys who use or are suspected of using drugs; it is a very interesting subject which is spoken about too little, more awareness is necessary and right and secondary school is probably a good vehicle for information; the involvement of influencers the topic turns out to be very current: the drug landscape has “evolved”; and with it the problem of addictions for young adolescents.

Portuguese teachers:

- seminars; discussion on physical and/or psychological dependence;
- how to demystify the concept of legal drugs; create institutional advertising on the subject.
- these themes have to be treated with care so as not to stimulate curiosity in students.
- to put, whenever appropriate, information on the subject of NPS in the school newspaper.
- prevention on consumption and alert for the scenario of not being an objective alternative
- it is very important the discussion on physical and/or psychological dependence
- it is very important the discussion on physical and/or psychological dependence
- reflection on what makes a youngster to consume NPS
- conceive activities that make the students get an informed knowledge of NPS and the creation of resources that can be used to disseminate information over the consequences of using NPS

Romanian teachers:

- participation in thematic symposia;
- it is absolutely necessary to train teachers;
- the presentation of the topic should be short but with a high impact on those involved;
- to do more research, as some drugs are addictive (Rhinofug, Dystonocalm, Nurofen) which, like anything addictive, do harm if a certain dose is exceeded. I've seen it in movies. I didn't pay much attention, as I think people have discernment;
- more homework on management; adult awareness through family doctors; more updated information;
- former users or their family members should be brought in to talk to students directly;
- to implement in as many schools as possible programs for the prevention of the use of toxic substances/ drugs;

- to have a teacher's manuals, regularly updated; new substances are always appearing, and I would like to know what their effects are, how to recognize when students have used certain substances, how to help them when they feel bad;
- the subject needs to be discussed to better inform young people in order to prevent/ stop them from using NPS, so that they will know what risks they are exposed when consuming NPS;
- focus on prevention; concrete examples; activities with specialists in the field; free discussions on drug use; a team of teachers should be set up at county level to produce these materials, and to propose a comprehensive plan for presentations and discussions, especially in rural and small rural schools; there is a lack of presentation materials, logistical support and staff dedicated to this approach; obviously depending on the available budget.

Concluding Remarks for Teachers' Answers

The teachers from the schools in Portugal, Italy, and Romania involved in the survey designed and distributed in the frame of the INES project, positively perceive the subject of NPS use prevention activities. The teachers have knowledge of NPS, their use, and associated effects, but they recognize the need for more knowledge coming from experts and specialized personnel. In the vision of teachers, the drug prevention activities that were organized in their schools (even if they are part of school curriculum or episodic activities) might be efficient and useful. The current teaching strategies for prevention and educational activities are mainly passive, the interactive methods, based on video presentations, testimonials, and debates, are mentioned by teachers and suggested to bring efficiency to the educational activity. The teachers are quite prudent in articulating their readiness to create and implement new teaching materials focusing on the prevention of NPS use. This issue requires more informative sessions to enhance teachers' more confidence in addressing the subject.

Overall, the INES project, with its innovative approach based on interactivity and collaboration in teaching the NPS subject appeared to be positively received.

Conclusions

In the frame of the INES project, the survey on the perception of students and teachers regarding NPS use prevention was designed and performed. Two questionnaires (one for students and one for teachers) were designed, distributed, completed and analysed. The study was performed on target groups belonging to the high schools involved in the project and comprised 357 students and 99

teachers. The answers provided several important information regarding project activities and teaching materials development.

Both students and teachers have information about NPS, their use and associated effects. The teachers assessed their own knowledge with a high degree of caution, and they declared (directly or via indirect answers) the need for more information on the subject.

The topic of NPS is approached in the schools mainly in episodic dedicated activities or in regular curriculum activities. The didactic approach is more passive (presentations or video presentation), but respondents (both students and teachers) declared the need for more interactive methods, mainly based on testimonies, case studies, by using video presentations or video games, debates. The students and teachers are willing to participate in activities and teaching materials development, but teachers have a sort of caution in expressing their approval, most probably due to the lack of information regarding the subject.

Most probably, the INES project will provide students and teachers with useful materials meant to be used in activities designated to fight against NPS use spread. At the end of the project, this aim proved to be fulfilled!

Acknowledgement

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Annex I.1. Survey on NPS learning needs for students

1. How well informed do you consider yourself on the topic of NPS? (possible answers: not at all informed; very little informed; well informed I; very well informed).
2. How well informed are you about the risks associated with NPS? (possible answers: not at all informed; very little informed; well informed I; very well informed).
3. Which of the following effects do you consider to be caused by the use of NPS? (multiple answers are possible); (possible answers: shortened attention span; reduced fatigue; amnesia; aggressive behaviour; impaired speech; reduced appetite; detachment; a strong feeling of relaxation; changes in sexual life; panic attacks; hallucinations; increased/ lowered blood pressure; blurry vision; loss of consciousness; paranoia; euphoria; muscle spasms; nausea; tachycardia; headache; il don't know; other, please specify).
4. Which of the following do you think are negatively impacted by the use of NPS? (multiple answers are possible); (possible answers: family relations; relations among classmates; friendships; NPS user's health; school performance; others, please specify).
5. Where do you think NPS are consumed/ used? (multiple answers are possible); (possible answers: in bars; in quiet areas; at music festivals and concerts; in clubs; in neighbourhoods; at parties; in recreational areas; in parks; at schools; at home; at a friend's house; somewhere else, please specify).
6. How much do the following reasons influence the use of NPS? (mark the answers using the indicated scale: never; partially; often; always; I don't know); (possible answers: to forget the worries, problems; to cheer the users up when they are in a bad mood; because it helps the users when they feel depressed, anxious; to relieve boredom; to pass the time; because the users like the feeling; because it's fun; because it's exciting; because it makes the users feel good; to be sociable; because it makes social gatherings more fun; because it improves parties and celebrations; because it is customary on special occasions; because the users feel more self-confident; to be liked; to fit in the group the users like; so the users don't feel left out; because of peer pressure; to know themselves better; because it helps the users to be more creative and original; to understand things differently; to be more open to experiences; to improve the users performances; to give the users more energy; to study or concentrate).
7. How strongly do you consider the use of NPS impacts the user's behaviour/ body? (mark the answers using the indicated scale: not at all; a little; a lot; completely; I don't know): (possible answers: satisfying curiosity; higher inclusion in the group (friends/ classmates/ acquaintances); well-being; health).
8. How strongly do you consider the use of NPS impacts the following aspects of the user's behaviour/ body? Answer using the scale below: 1. represents a strong decrease and 5. represents a strong increase; or I don't know; (possible answers: school performance; self-esteem, self-confidence; family relationships; appreciation within the group (friends/ classmates/ acquaintances); health).
9. To what degree do you consider the addiction to NPS can be controlled by the user? (possible answers: not at all; somewhat; average; completely; I don't know).
10. How would you describe a person who uses NPS? (multiple answers are possible); (possible answers: cool; someone who enjoys and seeks thrills; irresponsible; emancipated; popular;

easily influenced; without prospects; scared to be left out; emotionally unstable; extravagant; addicted; other, please specify).

11. How would you describe a person who refuses to use NPS? (multiple answers are possible); (possible answers: strong, resists peer pressure; mature; selective about his/her friend group; responsible; someone who doesn't know what they're missing out on; self-confident; someone who is able to anticipate the aftermath of drug use; cool; emancipated; popular; extravagant; others, please specify).
12. What type of actions/knowledge do you think could lead to the prevention or reduced use of NPS? (multiple answers are possible); (possible answers: informing and getting knowledge about NPS; informing and getting knowledge of the legal aspects regarding illicit substances; informing and getting knowledge of the negative effects of NPS on the user's health; requesting help and support; informing and getting knowledge of the negative effects of NPS on the friends; informing and getting knowledge of the negative effects of NPS on the family; informing and getting knowledge of the negative effects of NPS on the society; others, please specify).
13. Have you ever taken part in activities focusing on drug use prevention, done by authorized staff (teachers, specialists, authorities, others)? (Possible answers: yes; no).
14. How useful did you consider the drug use prevention activity that you have participated in? (possible answers: not useful at all; not useful; somewhat useful; very useful; I have never taken part in any drug use prevention activity; I don't remember/ I don't know).
15. Were NPS discussed during the drug use prevention activity that you have taken part in? (possible answers; yes; no; I have never taken part in any drug use prevention activity; I don't remember/ I don't know).
16. Did you appreciate the approach to the topic in the drug use prevention activity that you have participated in? (possible answers; yes; no; I have not taken part in any drug use prevention activities).
17. How was the information presented in the drug use prevention activity? (multiple answers are possible); (possible answers: oral presentation supported by PowerPoint slides; video presentation about drugs and their effects on the user; video presentation about drugs and their effects on the user, as well as discussions based on the video; free discussion on the topic of drug use; games; videogames; building and analysing possible scenarios about drugs use and their effects; I have not taken part in any drug use prevention activities; I don't remember; others, please specify).
18. How effectively do you consider the drug abuse prevention initiatives in your school to be? (possible answers: not efficient at all; not efficient; somewhat efficient; very efficient; I don't know).
19. The interventions proposed by your school are: (possible answers: episodic (1-2 times per year); part of the school curriculum; no specific interventions are implemented).
20. In your school's prevention activities, your involvement is mainly: (possible answers: "active" (I actively participate in the construction of educational proposals to address the issue of prevention); "passive" (I listen and try to understand what is important); no specific interventions are implemented).

21. How would you like to learn more about NPS, in school? Write down below your preferred means of learning.
22. What are the people/institutions/sources that you find trustworthy when learning about NPS? (multiple answers are possible); (possible answers: family members; friends; teachers; classmates; mass media; TikTok; Facebook; Twitter; YouTube; Wikipedia; Instagram; Podcasts; internet forums; specialists from different institutions/ associations; others, please specify).
23. Where persons should look for help, in case they need support regarding NPS use prevention or reduction? (multiple answers are possible); (possible answers: family members; friends; specialized institutions or associations; teachers; psychologists/ therapists; forums on social media; emergency phone number (112); others, please specify).
24. Would you be willing to take part in activities to create and distribute informational materials on the topic of NPS? (possible answers: yes; no; maybe; I don't know).
25. Would you be interested in collaborating with your teachers and peers in the construction of Open Educational Resources to counter the NPS phenomenon? (possible answers: yes; no; maybe; I don't know).
26. Which of the following didactic 'approaches' would you like to use to work on NPS prevention and education? (multiple answers are possible); (possible answers: practical cases and testimonies; group work (e.g. construction of information materials using digital technologies and online communication tools); construction of digital educational proposals and resources that see my active participation (and not only receptor of information); constructing a video game to deal with the problem of NPS; other, please specify).
27. The experts who are involved in prevention activities at school are: (multiple answers are possible); (possible answers: scientists; policemen; lawyers; teachers/ educators from other schools; teachers/ educators working in your school; representatives of the Ministry of Education; representatives of the Ministry of Health; privileged witnesses; other categories of experts, please specify, if you know).
28. What type of games do you enjoy playing? (possible answers: online/ virtual; face-to-face; others, please specify).
29. Name a few games you enjoy playing in your free time?
30. Who takes part in the games you enjoy playing? (multiple answers are possible); (possible answers: I play alone; friends; classmates; neighbours; acquaintances; I play with family; I play with unknown persons, whomever is available at the time; I don't play games; others, please specify).
31. Where do you usually enjoy playing games? (multiple answers are possible); (possible answers: at home; in school; at a friend's / classmate's house; in the park; at parties; in the neighbourhoods; I don't play games; other, please specify).
32. What movies/ series where characters use NPS have made an impact on you?
33. What books, where characters use NPS, have impressed you?
34. Would you like to learn about NPS? (possible answers: yes; no).
35. Your age is

Annex I.2. Survey on NPS teaching needs for teachers

1. How well informed do you consider yourself about drugs and their effects? (possible answers: not at all informed; very little informed; well informed; very well informed).
2. How well informed do you consider yourself on the topic of NPS? (possible answers: not at all informed; very little informed; well informed; very well informed).
3. Where do you get your information about NPS? (mark multiple answers if you consider it appropriate); (possible answers: family members; friends; teachers; other colleagues/ peers; mass media; TikTok; Facebook; Twitter; YouTube; Wikipedia; Instagram; Podcasts; internet forums; specialists from different institutions/associations; from school, through different programs aimed at dissemination of information about drug use; scientific literature (articles, reports, studies); others, please specify).
4. What are the people/institutions/sources that you find trustworthy when learning about NPS? (mark multiple answers if you consider it appropriate); (possible answers: family members; friends; teachers; other colleagues; mass media; TikTok; Facebook; Twitter; YouTube; Wikipedia; Instagram; Podcasts; internet forums; specialists from different institutions/ associations; from school, through different programs aimed at dissemination of information about drug use; scientific literature (articles, reports, studies); I don't know any trustworthy sources; others, please specify).
5. How harmful do you think NPS are? (possible answers: not at all harmful; a little harmful; harmful; very harmful; I don't know, I can't tell).
6. Which are the reasons why students are willing to try/to use NPS? (mark multiple answers if you consider it appropriate); (possible answers: imitating the behaviour of a friend group to avoid feeling different; the wish to stand out; imitating the behaviour of a friend group to avoid feeling left out; the wish to imitate a certain person; to become more self-confident; out of curiosity; to cope with personal difficulties; the wish to experiment with new things; availability of NPS at the places where they hang out; to follow the trend; to fit in the group they like; the wish to become a leader; to have fun; others, please specify).
7. Where do you think NPS are consumed/ used? (possible answers: in bars; in quiet areas; at music festivals and concerts; in clubs; in neighbourhoods; at parties; in recreational areas; in parks; in schools; at home; at a friend's home; somewhere else, please specify).
8. Do you think NPS creates addiction? (possible answers: from the first use; after 2-3 uses; after 4-5 uses; after more than 6 uses; NPS doesn't create addiction; I don't know/ I can't tell).
9. To what degree do you consider the addiction to NPS can be controlled by the user? (possible answers: very low; low; high; very high; I don't know).
10. Have you ever been approached by students with difficult personal issues asking for help/support? (possible answers: yes; no; I don't recall).
11. Are you willing to offer support to students with difficult personal issues? (possible answers: yes; no; I cannot decide).
12. Have you ever taken part in activities regarding drug use prevention, conducted by authorized personnel (teachers, specialists, authorities, others)? (possible answers: yes; no).
13. How effectively do you consider the drug abuse prevention initiatives in your school to be? (possible answers: not efficient at all; not efficient; somewhat efficient; very efficient; I don't know).

14. The interventions proposed by your school are: (possible answers: episodic (1-2 times per year); part of the school curriculum; no specific interventions are implemented).
15. In your school's prevention activities, your involvement is mainly: (possible answers: "active" (I actively participate in the construction of educational proposals to address the issue of prevention); "passive" (I listen and try to understand what is important); no specific interventions were implemented).
16. Were NPS discussed during the drug use prevention activity that you have participated in? (possible answers: yes; no; I have never taken part in any drug use prevention activity; I don't remember/ I don't know).
17. How useful did you consider the drug use prevention activity that you have participated in? (possible answers: not useful at all; not very useful; somewhat useful; very useful; I have never taken part in any drug use prevention activity; I don't know).
18. Did you enjoy the topic approach during the drug use prevention activity that you have participated in? (possible answers: yes; no; I have never taken part in any drug use prevention activity).
19. How was the information presented in the drug use prevention activity? (mark multiple answers if you consider it appropriate); (possible answers: oral presentation supported by PowerPoint slides; video presentation about drugs and their effects on the user; video presentation about drugs and their effects on the user, as well as discussions based on video; free discussion on the topic of drug use; games; video games; building and analysing scenarios around a character who uses drugs; I have not taken part at any drug use prevention activity; I don't remember; others, please specify).
20. To what extent are you interested in collaborating with your colleagues in the construction of open educational resources to counter the NPS phenomenon? (possible answers: I am not interested at all; I am somewhat interested; I am interested; I am very willing to be involved in such activities; I don't know).
21. How would you like to learn more about NPS use prevention? Please write down below your preferred means of learning.
22. Which of the following didactic 'approaches' would you like to use to work on NPS prevention and education? (mark multiple answers if you consider it appropriate); (possible answers: oral presentation supported by PowerPoint slides; video presentation about drugs and their effects on the user; video presentation about drugs and their effects on the user, as well as discussions based on video; free discussion on the topic of drug use; practical cases and testimonies; building and analysing scenarios around a character who uses drugs; games; video games; use of open educational resources available on the internet; group work (e.g. construction of information materials using digital technologies and online communication tools); construction of digital educational proposals and resources that see my active participation (and not only receptor of information); constructing a video game to deal with the problem of NPS; others, please specify).
23. Do you think watching a movie about the use and effects of NPS can have a positive effect on the prevention/ reduction/ ending of NPS use? (possible answers: yes; no; I don't know).
24. Which of the following would you like to find out more about? (mark multiple answers if you consider it appropriate); (possible answers: types of NPS; effects of NPS use; diffusion

channels of NPS; means of consumption of NPS; information sources about NPS; media representation of NPS and NPS users; others, please specify).

25. Do you consider it necessary for a subject on the topic of NPS to be included in the curriculum? (possible answers: yes; no; I don't know).
26. Would you be willing to take part in activities to create teaching aids on the topic of NPS? (possible answers: yes; no; I don't know).
27. What means of teaching about NPS to students, do you consider the most appropriate?
28. To what degree are you willing to be involved in teaching about NPS to your students? (possible answers: very low; low; high; very high; I don't know).
29. To what degree are you willing to create content on the topic of NPS for teaching to stud; (possible answers: very low; low; high; very high; I don't know).
30. Have you taken part in training programs for drug use prevention held by authorized personnel (teachers, specialists, authorities, others)? (possible answers: yes; no).
31. Given the specifics of the school you teach at, what are some of the issues you are faced with when approaching the topic of NPS in the classroom, topics that you wish to be included in the training program (ideas, suggestions)?
32. What do you consider to be useful in a training activity for teaching staff focusing on the topic of NPS (ideas, suggestions)?
33. Please add any further ideas or observations regarding the topic of NPS).
34. Your age falls into the range: (possible answers: 20...30; 31....40; 41...50; 51...60; over 60; I prefer to not answer).

Chapter II. INES Syllabus

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Module 1: NPS classification and categorisation

Introduction

This module introduces the classification and categorization of the following topics: the phenomenon of substance abuse, synthetic cannabinoids, analogues of cathinones, and phenethylamines.

Firstly, it has the purpose of introducing basic concepts regarding drugs of abuse in general and their possible classifications, based on different criteria. In order to better understand the NPS phenomenon and its many facets, general information is provided on drugs of abuse, their diffusion worldwide and their classification according to origin, mechanisms of action and chemical structure. Basic facts are provided on cannabinoids, cocaine, opioids and other drugs of abuse classes.

Secondly, it defines the concept of NPS and underscores their main points of similitude with, and difference from, “classical” illicit psychoactive substances (PS) in terms of chemical characteristics and other possible means of classification. This section defines and overviews the NPS phenomenon and its prevalence all over the world, problematizes the concept itself of NPS classification and proposes some possible solutions/approaches (according to age, activity, chemical structure, and others).

Finally, the chapter highlights some key notions regarding the possible classification of the three most widespread classes of NPS, i.e., synthetic cannabinoids, analogues of cathinones, and phenethylamines. Synthetic cannabinoids: The different chemical classes of synthetic cannabinoids are explained and their mutual relationships, and with natural ones, are explored. Some historical notes on the origin of synthetic cannabinoids and their names are also provided. Analogues of cathinones: Due to the strong chemical resemblance between cathinones, amphetamines and other synthetic stimulants, more chemical concepts in this space are explored and chemical resemblances and differences are underscored. Differences between natural and synthetic cathinones are also explained. Phenethylamines: The controversial, pioneering work of Alexander Shulgin in the synthesis of scores of different phenethylamines is discussed. Different groups of phenethylamines and their chemical relationships are explained.

As will be evident in the following, a few key people had a huge role in the synthesis and knowledge of hundreds of NPS belonging to the considered classes; moreover, it is now quite clear that several small modifications to basic chemical scaffolds of classic and novel PS can be carried out to obtain slightly or widely different biological effects, and that the most sought after of these effects can be

predicted to some extent. Both of these facts have concurred to the birth of the “designer drug” term, which is an umbrella word including all NPS that have been “designed” and synthesised by slightly changing the structures of known illegal PS, and were then manufactured with the specific purpose of avoiding prosecution (since the modified molecule would not be prohibited, differently from the well-known one), with or without the approval or knowledge of the original inventor. It should be noted that this strategy is now mostly pointless, since many States have started to make illegal all known and unknown derivatives of already prohibited compounds. For example, the United States Drug Enforcement Administration (DEA) divides most illegal PS (which they call “controlled substances”) into five different lists, called “Schedules” (from I to V, in descending order of abuse potential). It also explains that “a substance need not be listed as a controlled substance to be treated as a Schedule I substance for criminal prosecution. A controlled substance analogue is a substance which is intended for human consumption and is structurally or pharmacologically substantially similar to or is represented as being similar to a Schedule I or Schedule II substance and is not an approved medication in the United States” (United States Drug Enforcement Administration, 2024).

Basic concepts on “classical” drugs of abuse

When considering classical drugs of abuse (DoA), one implicitly means classical “illicit” DoA. Although “legally available” DoA, such as alcohol and nicotine, are currently much more widespread and cause many more fatalities than illicit ones, they do not cause the kind of social and political worries that the latter ones do. Typically, the sale of legal DoA is restricted only based on user age.

Nature, use and diffusion

Most “classical” drugs of abuse (DoA) have a natural origin and have been in use for thousands of years. Over the last one hundred and seventy years (i.e., since the birth of modern synthetic chemistry with Berthelot's syntheses of non-natural fats in 1853) (Wentrup, 2022), some fully synthetic DoA have been introduced, as well as countless artificial chemical modifications to natural molecules.

Classical DoA are most usually divided into discrete classes for reporting and study purposes. In official national and international organisation reports, a classification of DoA according to mixed chemical structure and biological effect criteria is almost universally used. Following this model, at least six main DoA classes can be identified: cannabinoids, opioids, amphetamines, cocaine, MDMA (“ecstasy”), and hallucinogens, with many other lesser classes possibly present. In turn, these mixed classes are often attributed to a few, big, non-univocal super-classes of (purely) biological effects:

central nervous system (CNS) stimulants (amphetamines, cocaine), CNS depressants (opioids), hallucinogens (cannabinoids, hallucinogens, ecstasy) (United Nations Office on Drugs and Crime, 2022).

While the finesses of one DoA belonging to one class (or super-class) or the other can be debated at will, it is now scientifically undisputed that biological effects are linked to the drug's interaction with specific, microscopic body structures called "receptors" (Du, Li, & al., 2016). In turn, receptor interaction necessarily requires the fitting of the relatively small DoA molecules (ligands) into a specific site ("active site") of the relatively big receptor macromolecule, according to size, shape and chemical affinity properties. This fitting mechanism causes a modification in the receptor's tridimensional structure that produces the observed biological effect. This mechanism is often referred to as the "key and lock model", since it resembles the key (DoA molecule) fitting into the lock keyhole (receptor active site) and the consequent opening of the lock/door (effect). As is immediately evident even from this highly simplified overview, chemical structure, receptor interaction and biological effects are inextricably linked, and thus any classification carried out along one of these lines is largely superimposable to any other classification carried out along another one of these lines. Of course, "largely superimposable" does not mean "identical", and thus significant margins of discretion and uncertainty remain to this day.

Regarding worldwide prevalence of use, as of 2022 (United Nations Office on Drugs and Crime, 2022), the most widespread classical DoA is by far Cannabis (i.e., its psychoactive components, cannabinoids, and in particular Δ 9-tetrahydrocannabinol or THC), with an approximate 209 million users worldwide (between 149 and 265 millions), followed by opioids with 61 million users (37-78) and by amphetamines with 34 million users (29-41). Cocaine and MDMA count 21 (18-26) and 20 (9-36) million users, respectively. For perspective, about 2.3 billion people are currently alcohol drinkers (World Health Organization, 2019), and about 1.3 billion people use tobacco/nicotine (World Health Organization, 2021).

All other classes trail the ranking. Regional differences are quite important, also due to use traditions, production and trade peculiarities and local law. For example, North America is currently experiencing a huge increase in opioid use (the so-called "opioid crisis"), while cocaine is on the rise in Europe. Opioids and cocaine together cause the large majority of deaths attributable to DoA (United Nations Office on Drugs and Crime, 2022).

Cannabinoids

As already reported THC, a cannabinoid, is the main psychoactive substance (PS) in products obtained from the *Cannabis sativa* plant (Figure II.1), such as marijuana (dried inflorescences) and hashish (dried resin). The plant itself contains more than 200 cannabinoids, however almost all of them are not psychoactive. They share the same basic structure, and biological activity is mostly related to specific “cannabinoid receptors” (CB1, CB2) (Li, Shen, & al., 2020), whose endogenous ligands are fatty acid-related compounds including anandamide.

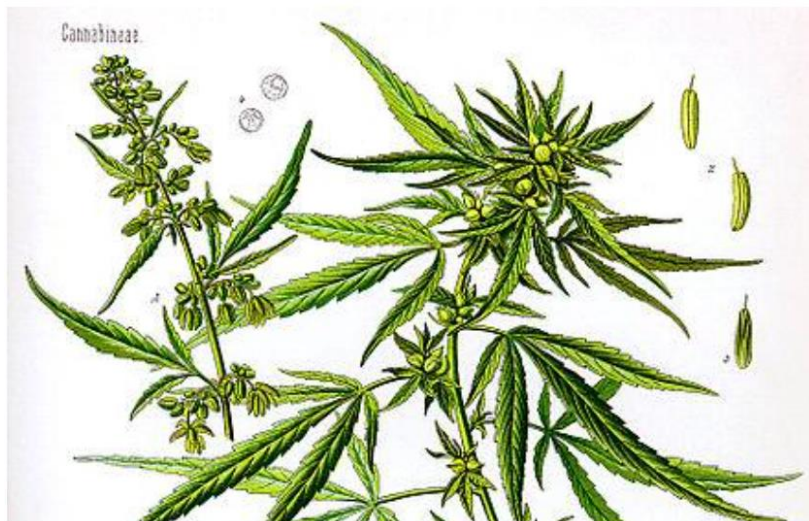


Figure II.1. *Cannabis sativa* representation from a scientific drawing (XX century).

Cannabis products are mostly consumed as such, so chemical modifications or synthetic analogues of cannabinoids are not considered classical PS. Cannabinoids are usually taken by smoking, since heat causes the decarboxylation (loss of a carboxylic acid, Figure II.2) of the cannabinoid acids overwhelmingly contained in the plant to produce the free cannabinoid form (Figure I.2), which is active; moreover, smoking produces immediate contact with blood and thus fast onset of the desired effects. Effects of administration vary hugely and can be described as hallucinogenic, CNS depressant and entactogen (i.e., facilitating interactions and empathy between people). Although natural cannabinoids do not cause important physical dependence nor acute overdose toxicity, long-term effects include psychiatric disorders, tolerance to the effects and craving (Gorelick, 2023).

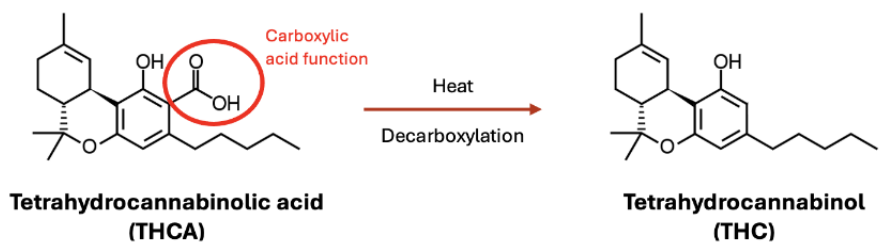


Figure II.2. Conversion of THCA into THC by decarboxylation.

Cocaine

Cocaine (Figure II.3) is the only member of its class of CNS stimulants, is extracted from the leaves of the *Erythroxylon* (or *Erythroxylum*) coca (Figure II.4) plant and no synthetic or semi-synthetic derivative has been produced with any success, although amphetamines have some structural resemblance to it.

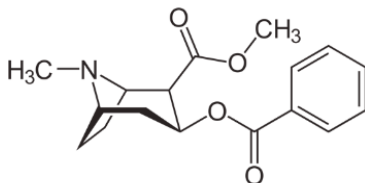


Figure II.3. Chemical structure of cocaine.



Figure II.4. *Erythroxylum coca* representation from a scientific drawing (XIX century).

Cocaine acts by inhibiting the removal of dopamine from synapses and also by interacting with serotonin (5-HTx) receptors, producing intense pleasant feelings, lack of sleep and hunger and hyperactivity: it is the CNS stimulant par excellence. It is mostly consumed by insufflation (“snorting”) or by injection to obtain an immediate effect. Negative effects include hypertension, stroke, infarction and withdrawal syndrome (National Institute on Drug Abuse, 2024).

Opioids

Opiates are natural substances originating from the unripe capsules of *Papaver somniferum* (Figure II.5), exuding a latex known as opium. Morphine (Figure II.6) causes the bulk of the product’s effects, and many structurally related substances are contained within. The basic morphinan skeleton of morphine has been modified in several ways, originating several semisynthetic (hydroketone, oxyketone, benzomorphan) opioid groups.



Figure II.5. *Papaver somniferum* representation from a scientific drawing (XIX century).

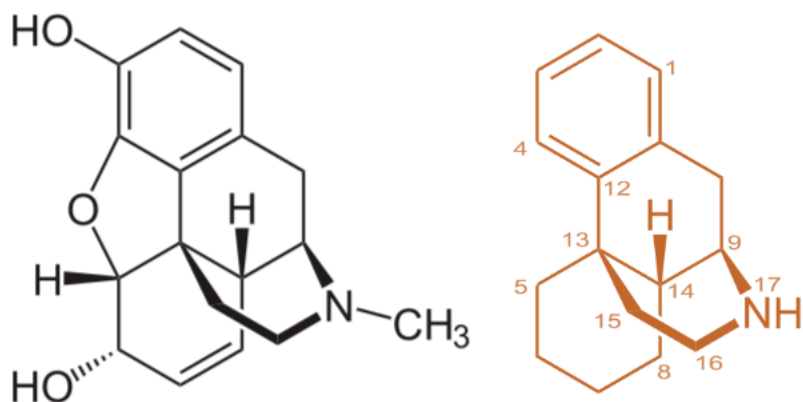


Figure II.6. Chemical structure of morphine. The morphinan skeleton is next, outlined in kaki. Completely synthetic opioids are also available, with unrelated chemical structures (phenylpiperidine or diphenylpropylamine classes, Figure II.7) but qualitatively similar activity and still classified as classical DoA, but with exceptions. Biological effects are mediated by opioid μ , κ , and δ receptors, producing intense pleasure and sleepiness. Intense physical dependence and tolerance, withdrawal syndrome and respiratory depression with suffocation are among the most worrisome negative effects (Valentino & Volkow, 2018).

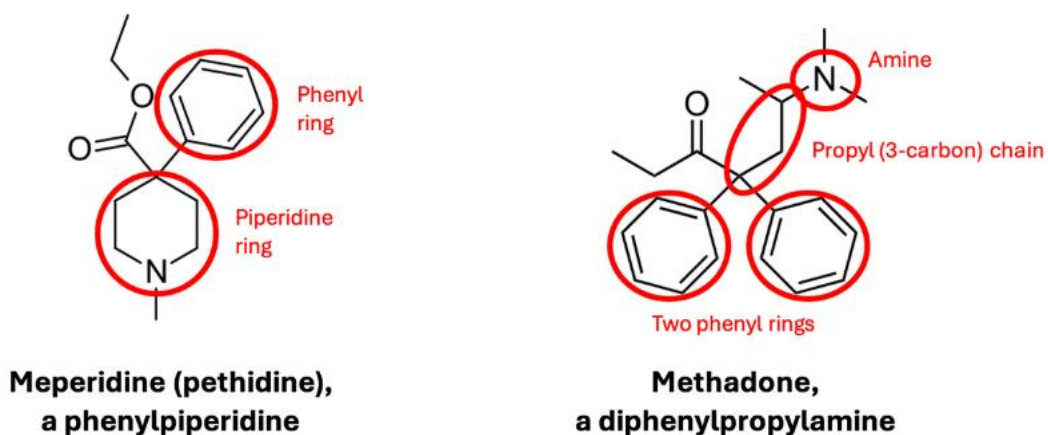


Figure II.7. Chemical structures of meperidine (a phenylpiperidine opioid) and methadone (a diphenylpropylamine opioid).

Novel psychoactive substances and their classification

Attempts at an official definition of NPS have been made by several national and international agencies; one of the most effective ones has been proposed by the United Nations' Office on Drugs and Crime (UNODC):

«Substances of abuse, either in a pure form or a preparation, that are not controlled by the 1961 Single Convention on Narcotic Drugs or the 1971 Convention on Psychotropic Substances, but which may pose a public health threat» (United Nations Office on Drugs and Crime, 2021). The Agency then proceeds to specify that «The term “new” does not necessarily refer to new inventions—several NPS were first synthesized decades ago—but to substances that have recently become available (again) on the market» (United Nations Office on Drugs and Crime, 2021).

Thus, the distinction itself of NPS from classical DoA is already a form of classification, including in the former:

1. **Recently synthesised or recently modified compounds;**
2. Compounds of natural origin, or synthesised more than about two decades ago, which have always been scarcely or only locally consumed or have been traditionally obscure and mostly ignored, and **have only recently known a socially and epidemiologically significant increase in consumption;**
3. Compounds of natural origin, or synthesised more than about two decades ago, which **have fallen out of favour with users, and have only recently known a socially and epidemiologically significant rebound in consumption.**

From the above points, it can easily be surmised that an NPS classification based on chronological and usage data is possible, although of course its details can be debated and subject to interpretation.

In any case, the most frequently used (and thus most important) kind of NPS classification is by a wide margin the one based on both chemical structure and biological effect (United Nations Office on Drugs and Crime, 2022). As already noted above, these two categories show a large degree of superimposition, since chemical structure is key to biological effect. As a consequence, we will now examine the three most important classes of NPS from a chemical point of view, with the caveat that the classification can be mostly extended to biological activity. The UNODC classifies NPS into five main definite classes, i.e., stimulants, cannabinoid receptor agonists (“synthetic cannabinoids”), classic hallucinogens, opioids, sedatives/hypnotics, and dissociative hallucinogens, in order of decreasing frequency; a six class (“not yet assigned”) is also present (United Nations Office on Drugs and Crime, 2022). Both synthetic cathinones and phenethylamines belong to the stimulant class.

As one can see, this classification could easily be applied to classical illegal PS as well, and this is not by chance: as a matter of fact, all or almost all of the currently known NPS are related, either by chemistry or by biological effect, or by both, to classical PS. So, it is also apparent how some basic

knowledge of classical PS is really needed to understand the NPS phenomenon in all its complexity. And, since most classical PS can be traced back to natural substances, most NPS can as well, at least regarding their mechanism of activity.

Synthetic cannabinoids

Phytocannabinoids are by far the most consumed “illicit” drugs of abuse in the world; synthetic cannabinoids, on the other hand, are less widespread worldwide than NPS with stimulant effect, although the difference in users is not wide (34% for stimulants vs. 29% for synthetic cannabinoids) (United Nations Office on Drugs and Crime, 2022).

From a chemical point of view, they can be further divided into three sub-classes: classical cannabinoids, non-classical cannabinoids and unrelated (Potts, Cano, & al., 2020). Classical cannabinoids (e.g., HU-210, Figure II.8) closely mimic the general chemical structure of phytocannabinoids, but introduce modifications that cannot be found in the latter. In particular, they all have a terpenophenolic structure derived from 2-substituted 5-amylresorcinol.

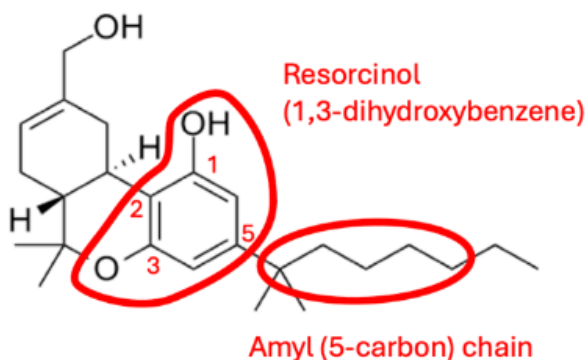


Figure II.8. Chemical structure of the classical cannabinoid HU-210, a 2-substituted 5-amylresorcinol.

On the contrary, non-classical cannabinoids, like CP-47,497 (Figure II.9) have different structures, in particular they do not keep the three-fused-ring (dibenzopyran) scaffold of natural cannabinoids. However, they possess microscopic chemical-physical characteristics that closely resemble those of the latter. Thus, they are able to bind and interact with cannabinoid receptors in the body in ways that are surely similar to that of THC and analogues. This is due to the fact that they possess chemical substituents having chemistries similar to the natural cannabinoids’ ones, and that the overall shape and size of the molecule are similar to those of phytocannabinoids, at least in the key points of interaction with the receptor.

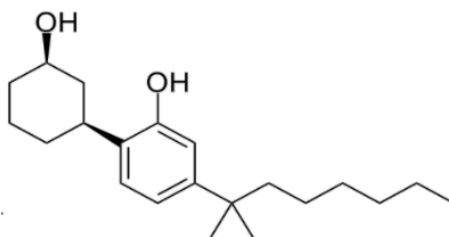


Figure II.9. Chemical structure of CP-47,497.

Medicinal chemists call this phenomenon (different substituents with similar chemical-physical properties and thus similar biological activities) “bioisostery” (Banister, Stuart, & al., 2015). Unrelated compounds (e.g., JWH-018, Figure II.10) are those not bearing any obvious resemblance to the basic cannabinoid structure, not even from a purely chemical-physical point of view. Over the years, this latter sub-class is the one that has probably had the most remarkable success, with the synthesis of hundreds of compounds.

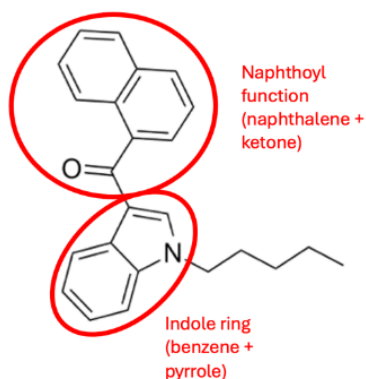


Figure II.10. JWH-018, a synthetic cannabinoid with naphthoylindole structure.

One single researcher had a particularly relevant role in this field, namely John William Huffman. While working at Clemson University in North Carolina (USA) on projects funded by the National Institute on Drug Abuse (NIDA), his research group synthesized as much as 400 derivatives with cannabinoid-like activity (Wiley, Marusich, & Huffman, 2014). Nowadays, all compounds synthesized at Clemson are known with codenames corresponding to those given by the laboratory at the time, including the “JWH-” prefix followed by a three-digit number. The JWH prefix indeed refers to Huffman’s initials. Most of these synthetic cannabinoids can be considered as part of the “unrelated” group, since they possess naphthoylindole (Figure 10), naphthoylpyrrole, naphthylmethylindole or phenylacetylindole (Figure II.11) structures.

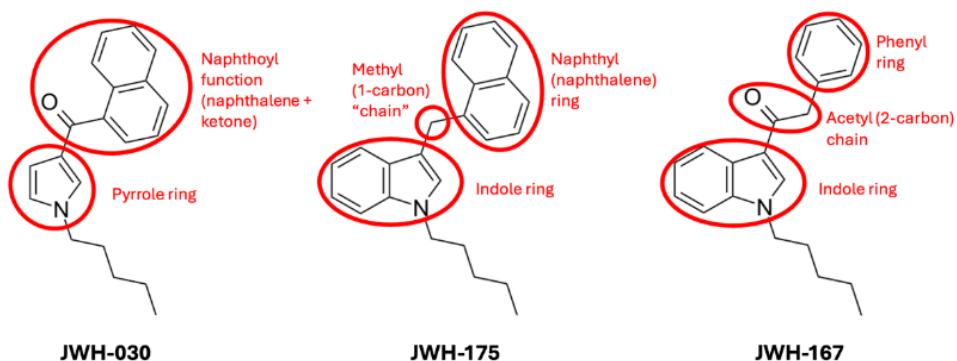


Figure II.11. Chemical structures of JWH-030 (a naphthoylpyrrole), JWH-175 (a naphthylmethylindole), and JWH-167 (a phenylacetylindole).

Other derivatives, however, were dibenzopyrans (Figure II.12) and thus bore some resemblance to the classical cannabinoid structure (Huffman & Padgett, 2005).

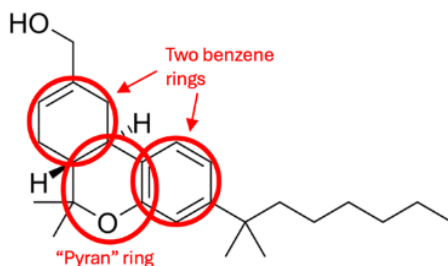


Figure II.12. Chemical structure of JWH-051, a dibenzopyran.

Synthetic JWH cannabinoids are among the most widespread NPS since at least 2008, when the first seizure of JWH-018 occurred in Germany. JWH-018, or closely related molecules, have been widely manufactured in illegal laboratories due to their ease of synthesis: as soon as JWH-018 was prohibited, analogues with slightly modified side chains started to appear on the market to circumvent the ban. This strategy, typical of illegal manufacturers, is now mostly pointless, since most countries have started to extend their bans to all closely related, known or unknown, substances of a prohibited one. From an analytical point of view, however, the strategy can still obtain some success, since methods optimized for a single, specific compound are mostly unable to detect similar compounds that were not known when the analytical method was developed.

Analogues of cathinones

Cathinone analogues are synthetic compounds related to cathinone (Figure II.13), the main PS contained in the kath or qat plant (*Catha edulis*, Figure II.14), and are the compounds most

frequently contained in the so-called “bath salts”; this was both the form used to legally sell them in grey market stores and their most frequent street name (National Institute on Drug Abuse, 2024).

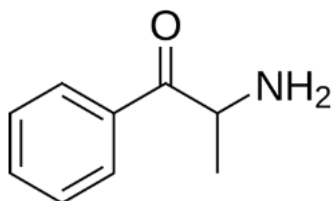


Figure II.13. Chemical structure of cathinone.

Like their parent, all of them share their basic chemical scaffold with phenethylamines, which are however derived from a synthetic substance, amphetamine. The main chemical difference between cathinones and phenethylamines is the presence of an oxygen atom (technically known as a “ketone group”) on the cathinone molecule, which is absent in phenethylamines. The “-one” suffix in “cathinone” specifically refers to this ketone group, since it is the standard way to form some chemical names of substances containing ketone groups (e.g., acetone, cyclohexanone, etc). This relatively small chemical difference, however, produces significant biological differences: While both sub-classes can be included into the stimulant class, cathinones tend to cause tachycardia, hyperthermia, and rhabdomyolysis more frequently than phenethylamines (Weng & Chen, 2022) and hypoglycemia, which is not typical of the latter (Banks, Worst, & al., 2014).

The simple structure and easiness of synthesis have made synthetic cathinones very easily available at low prices on the illegal market, and this in turn means that the relatively obscure natural PS cathinone has given rise to many much more widespread and common NPS. Moreover, in the NPS field, relatedness to an infrequent classical PS is an advantage, since it makes detection and prosecution more difficult (Couto & Gonçalves, 2018). Of course, the advantage was mostly lost as soon as synthetic cathinones became one of the most widespread NPS types and legislation started to make all drug analogues illegal. Anyway, the sheer number of different synthetic cathinone derivatives is somewhat limited by the structure simplicity itself (Calinski, Kisor, & Sprague, 2019), since there is a limit to the number and type of changes that can be made to the molecule without making it inactive or imbuing it with a completely different activity, thus effectively transforming it into a drug from another class.



Figure II.14. *Catha edulis* representation from a scientific drawing (XX century).

Phenethylamines

As already noted, phenethylamines share the phenylethylamine backbone with cathinones but without the ketone group. The parent drug of this class is amphetamine (alpha-methylphenylethylamine, Figure II.15), a completely artificial molecule and a classical PS first synthesised in 1887 by the Romanian chemist Lazăr Edeleanu while working at Berlin University (Rasmussen, 2015). Several amphetamine analogues, such as methamphetamine and ecstasy, are classical PS with stimulant activity, but several other derivatives (e.g., para-methoxyamphetamine, PMA, or 4-methoxyamphetamine, 4-MA, Figure II.16) are considered NPS and can have both stimulant and psychedelic properties.

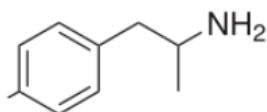


Figure II.15. Chemical structure of amphetamine.

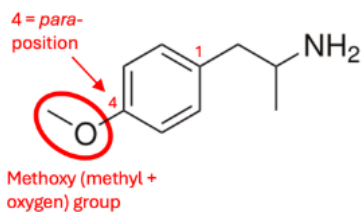


Figure II.16. Chemical structure of PMA (4-MA).

A specific chemical modification, i.e., the closing of a second ring in the molecule (Figure II.17), increases its rigidity and gives rise to a separate sub-class, the 2-aminoindanes (for example, methylenedioxyaminoindane, MDAI, Figure II.18), with slightly different properties. As can be seen from these few examples, the common names of many phenethylamines use acronyms referring to their chemical name or important chemical features.

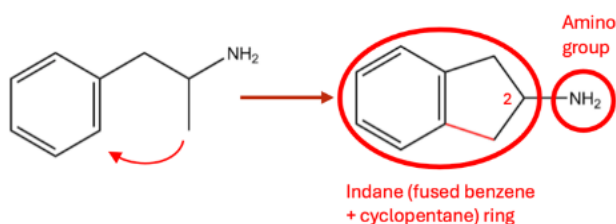


Figure II.17. Chemical structure of 2-aminoindane and its relationship with amphetamine.

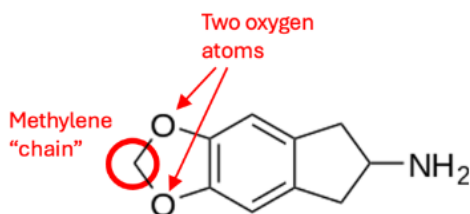


Figure II.18. Chemical structure of MDAI, a 2-aminoindane.

A key figure in the synthesis and development of many phenylethylamines as recreational substances was Alexander Shulgin, who as an employed chemist at Dow Chemicals in California (USA) developed the first biodegradable pesticide (mexacarbate). His personal interests, however, went in the direction of synthesising and testing himself many new and different stimulants and hallucinogens. Many of the different compounds he manufactured were phenethylamines, and Shulgin described their synthesis and his self-experimenting in a book titled *PIHKAL: A Chemical Love Story* (Shulgin & Shulgin, 1991), where “PIHKAL” stands for Phenethylamines I Have Known and Loved. Later, he also published *TIHKAL (Tryptamines I Have Known and Loved)* (Shulgin & Shulgin, *TIHKAL: The Continuation*, 1997), about another class of mostly psychedelic compounds. He is considered

the inventor of at least two sub-classes of phenethylamines, commonly called “2C” (or “2C-X”) and “DOx”. As usual, these are abbreviations of the compounds’ chemical names, or of some of their important chemical features: regarding the former, 2C refers to the number of carbon atoms between the benzene and the amino groups. All members of this class possess two methoxy groups in positions 2 and 5 of the benzene ring, and another lipophilic (i.e., fat-like) substituent in position 4 (or a second ring fused at positions 3 and 4): some examples are 2C-B (B refers to the bromine atom in position 4) and 2C-G-3 (3 here refers to the 3-carbon chain forming a fused ring at positions 3-4): structures are shown in Figure II.19.

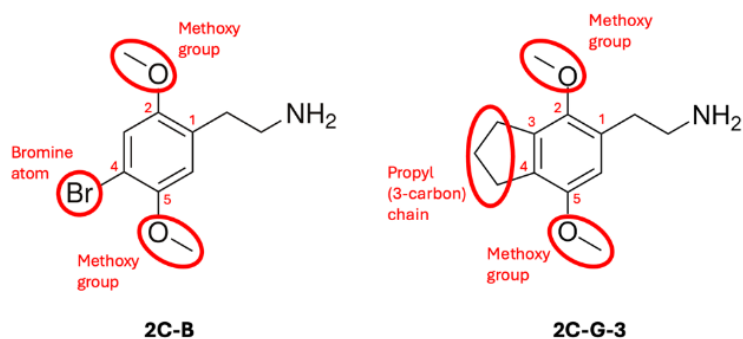


Figure II.19. Chemical structures of two representative members of the 2C sub-class, 2C-B and 2C-G-3.

Members of the DOx subclass share similar chemical features with 2C phenethylamines (“DO” refers to the “dimethoxy” feature also possessed by 2C compounds), but with somewhat different biological effects, due to binding to different brain receptors. The common naming convention in this case is the prefix “DO” followed by one to three upper case letters (e.g., DON, DOAM, Figure 20), with the suffix specifying a substituent: for example, DON contains a nitro (NO₂) substituent, while DOAM contains an amyl (five-carbon atom chain) group, as can be seen in Figure II. 20.

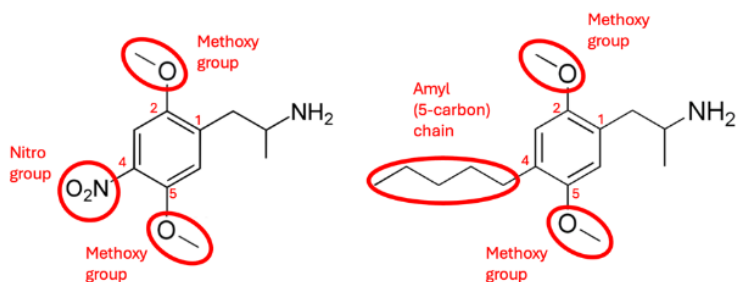


Figure II.20. Chemical structures of two representative members of the DOx sub-class, DOAM and DON.

Some members of the sub-class form their common names using a different convention, by using the “Aleph-” prefix followed by a number (e.g., Aleph-1) or another acronym altogether (e.g., 2,5-dimethoxy-4-ethoxyamphetamine, MEM), as shown in Figure II. 21.

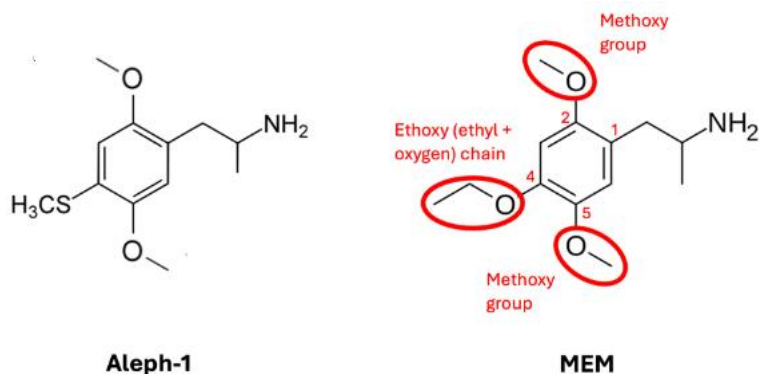


Figure II.21. Chemical structures of two members of the 2C sub-class that do not follow the common naming convention, Aleph-1 and MEM.

A more recent sub-class of phenethylamines has begun to appear on the illegal market during the 2010s, the so-called “NBOMe” or “25X-NBOMe” group. They are 2C analogues, but with much bigger substituents in the molecule, and this makes them much stronger psychedelics, with concrete danger for the life of users (Poulie, Jensen, & al., 2020). The common “NBOMe” name refers to their N-benzyl-O-methyl feature, while the “25X-” prefix indicates the type and position of other substituents: for example, 25I-NBOMe contains an iodine atom (in position 4 of the main phenyl ring) and two methoxy groups in the 2 and 5 positions of the same ring (Figure II. 22).

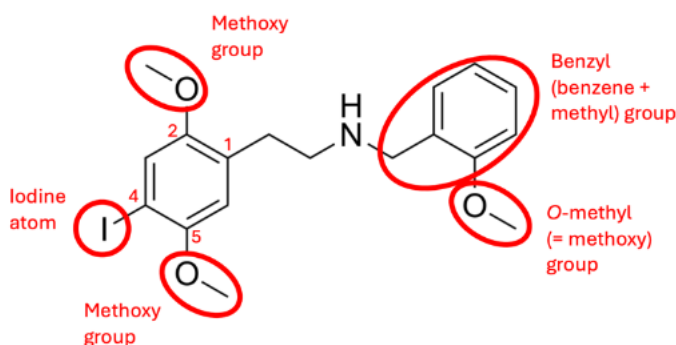


Figure II.22. Chemical structure of 25I-NBOMe.

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Module 2: Toxic effects and risk assessment

New psychoactive substances (NPS) have significantly altered drug consumption patterns and the current landscape of addiction. Sought for their psychoactive properties, these substances are not regulated under international drug laws despite being abused drugs. NPS have emerged as alternatives to illegal drugs, rapidly gaining popularity due to their easy availability on the internet. At a European level, the European Union Drugs Agency (EUDA) estimated that around 5% of young people aged 15–24 years have already consumed at least one of these NPS. By the end of 2023, the EUDA was monitoring around 950 NPS, with 400 distinct substances detected in seizures in 2022 and a record 30.7 tonnes seized by the EU (European Union) Member States in 2023 (European Drug Report, 2024). Synthetic cathinones and cannabinoids constitute more than two-thirds of the NPS available since 2005 (Figure II.23.). In 2023, the EU Early Warning System reported 26 new NPS for the first time, including three synthetic cathinones, nine synthetic cannabinoids, and four phenethylamines. Concerns are growing about the proliferation of new synthetic opioids, such as the highly potent nitazenes, which can be hundreds of times more potent than heroin, with seven new substances reported in 2023. The health risks associated with these novel compounds are often unknown, potentially exposing consumers to serious or fatal poisonings and other health problems.

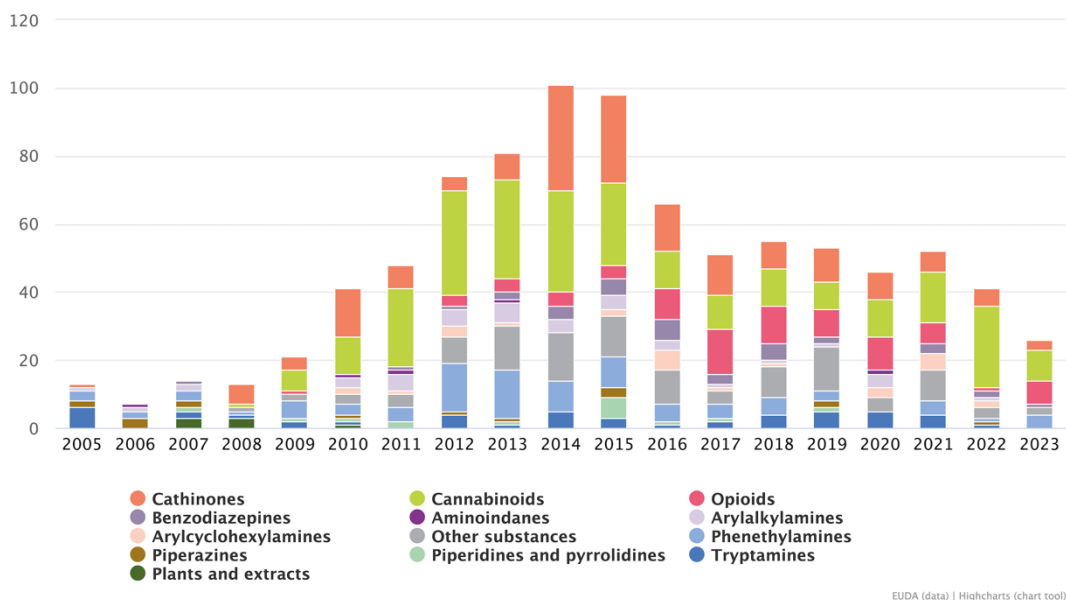


Figure II.23. The NPS reported to the EU Early Warning System for the first time between 2005 and 2023 (figure retrieved from European Drug Report 2024 of EUDA).

Synthetic Cannabinoids

Synthetic cannabinoids are sprayed onto natural, harmless herbs to mimic the euphoric effects of cannabis. Cannabis consumers may also inadvertently be exposed to synthetic cannabinoids due to reports of herbal products containing THC or other natural cannabinoids being contaminated with these synthetic substances. Given their high potency, such adulterated products pose significant poisoning risks. In 2022, semi-synthetic cannabinoids such as hexahydrocannabinol (HHC) began appearing on the European drug market, and their effects in humans are not well-studied, making it challenging to assess associated risks. Synthetic cannabinoids are typically smoked, leading to rapid absorption and fast onset of effects, but can also be ingested as tea, though this is less common due to inconsistent absorption. They stimulate CB1 and CB2 receptors in the central nervous system, decreasing the release of several inhibitory and excitatory neurotransmitters. Their primary effects include relaxation, euphoria, and disinhibition. However, other neurological manifestations such as ataxia, agitation, consciousness and memory disturbances, altered concentration, tremor, headache, irritability, anxiety, aggressiveness, hallucinations, convulsions, paranoia, and suicidal ideation have been reported. Other systems can also be affected, leading to cardiovascular issues (e.g. arrhythmias), pulmonary problems (e.g. pneumonia), hepatic damage (e.g. liver failure), kidney damage (e.g. renal failure, digestive issues (e.g. abdominal pain), muscular damage (e.g.

rhabdomyolysis), dermatological issues (e.g. acne), and ophthalmic problems (e.g. blurry vision). Compared to cannabis, synthetic cannabinoids are more potent and induce more serious adverse events, including hypertension, drowsiness, confusion, tachycardia, hallucinations, agitation, and seizures, which can sometimes be fatal.

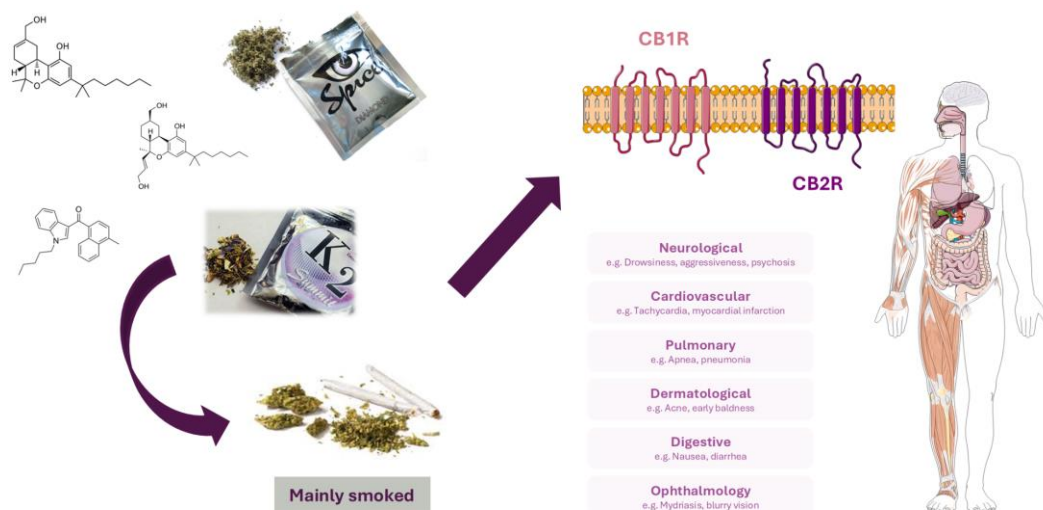


Figure II.24. Main adverse events of synthetic cannabinoids.

Synthetic Cathinones

Synthetic cathinones, often mislabeled and sold as bath salts or plant feeders, are synthetic drugs chemically related to cathinone, a psychostimulant found in the khat plant. These substances mimic the effects of controlled drugs such as cocaine and ecstasy but are much more potent. Sold in small plastic packages labelled as 'not for human consumption', they are usually ingested or insufflated, with dosage varying based on the derivative's potency and the administration route. Synthetic cathinones affect the central nervous system, acting either as monoamine reuptake inhibitors without significant monoamine releaser effects (cocaine-like) or as monoamine reuptake inhibitors and releasers (cocaine-amphetamine-mixed-like). This results in increased monoamines in the intersynaptic space, leading to neuron overstimulation and psychostimulant and hallucinogenic effects. However, neurological manifestations such as ataxia, agitation, consciousness and memory disturbances, altered concentration, tremor, headache, irritability, anxiety, aggressiveness,

hallucinations, convulsions, paranoia, and suicidal ideation can occur. Chronic abuse can lead to acute psychosis, paranoid ideation, and delusions, similar to the effects of other amphetamines.

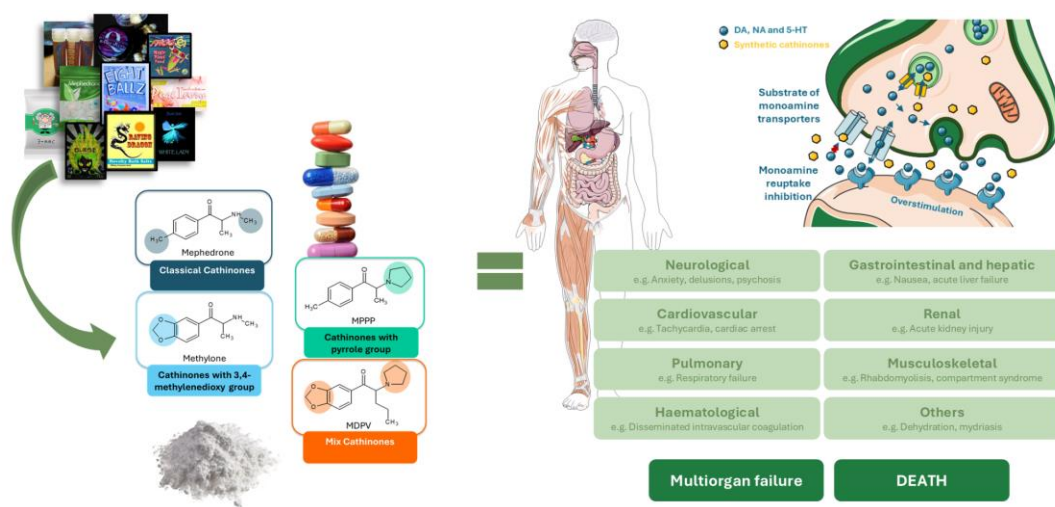


Figure II.25. Main adverse events of synthetic cathinones.

Psychedelic Phenethylamine Derivatives

Usually ingested, psychedelic phenethylamine derivatives are chemically modified from phenethylamine and represent a significant group of NPS. These substances are primarily classified into two groups, 2-C and NBOMe, which share similar chemical structures with amphetamine, catecholamines, synthetic cathinones, and other substances. Their stimulant and hallucinogenic effects result from agonist activity on 5-HT_{2A} receptors in the central nervous system, and they also affect dopaminergic signalling, inducing rewarding and reinforcing effects that may lead to abuse. In vitro studies have shown high neurotoxicity through mechanisms such as mitochondrial dysfunction, calcium homeostasis disruption, and oxidative stress. Clinically, these drugs can cause dizziness, nausea, vomiting, diarrhoea, hyperthermia, hypertension, tachycardia, headaches, and body pains. Severe neurological impairments, including confusion, depression, acute psychosis, seizures, coma, and cerebral oedema, have also been reported.

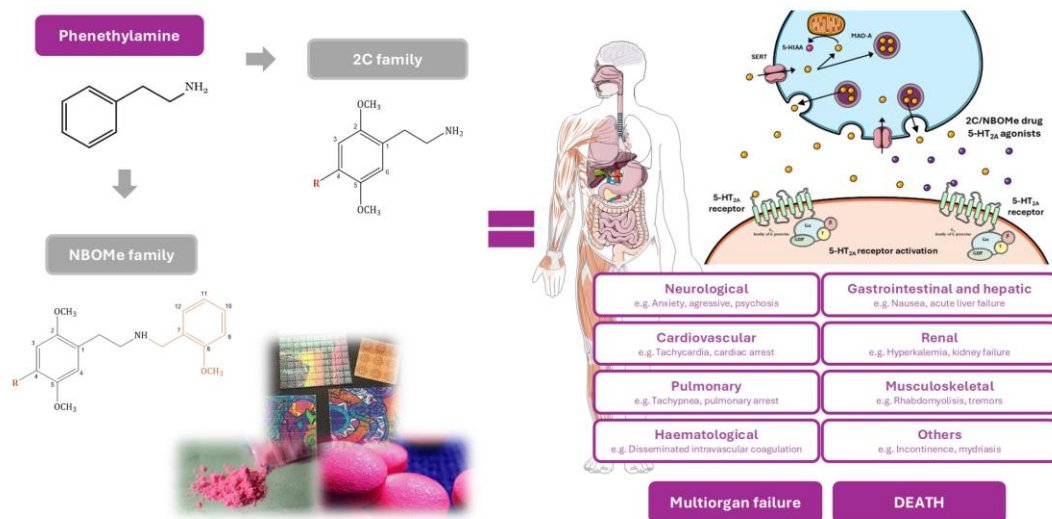


Figure II.26. Main adverse events of phenethylamine derivatives.

Module 3: Diffusion channels

Since 2008, new psychoactive substances (NPS) have multiplied, so the market has developed significantly, and the market for regulated drugs also includes more and more of the new substances. The NPS market itself is characterized by a high turnover of inexpensive, readily available, and replaceable chemicals and is very robust and dynamic. It is now recognized that NPS pose a hazard to public health and are a worldwide policy concern (EUDA, <https://www.euda.europa.eu>).

Questions like “How do NPS penetrate into young peoples’ networks?”, “How can youngsters be influenced to make an informed decision about NPS consumption?” are complex and require analysis from different angles and through multiple lenses.

The module “Diffusion Channels” developed in the frame of the INES project (<http://ines.unibo.it>) aims to provide the basic information that can facilitate the understanding of the complex process of new psychoactive substances (NPS) penetration in social groups. It proposes the analysis on NPS penetration using the lenses of Diffusion of Innovation Theory (DOI), which successfully explained how, why, and at what rate new ideas, processes, and technologies spread through a population or community through certain channels, over time. The DOI was developed by Everett Rogers in 1962 (Rogers, 1962), and it has been demonstrated that it can be applied to explain the diffusion of an NPS product (Wallis, 2018). The module, comprising three didactic units, was designed under the

guiding question: How can people (youngsters) make an informed decision regarding the big challenge - “to take or not to take NPS”? Therefore, the question for the teacher becomes: What actions can teachers do to support students to make the right decision and/or to support them if something goes wrong?

The module consists of three didactic units (DU):

The first didactic unit (NPS diffusion process) looks at the NPS diffusion process, namely how NPS penetrate different groups, especially of young people, and individuals can become potential consumers.

The second didactic unit (Channels for NPS distribution) focuses on the channels of distribution, i.e. how NPS are distributed to the groups of young people, either by face-to-face contact or on-line.

The third didactic unit (Reliable sources of information) is concerned with reliable sources of information regarding NPS. It looks at what makes a trusted source and provides examples of reliable information sources when learning about NPS.

NPS diffusion process

The class of substances known as New Psychoactive Substances (NPS) is constantly evolving. Even the term “new” is sometimes misleading (as, for example mephedrone was first synthesized in 1929). Usually, when speaking about “new” psychoactive substances, one can refer to those developed after 2008, the mephedrone-craze period. Due to the increasing number of NPS flooding the drug market, as well as the fast-evolving nature of the NPS, they can be approached as an innovation. This led to the idea of examining the diffusion of NPS through various groups within the framework of the diffusion of innovation theory (Wallis, 2018) with the aim of examining how NPS spread over time across markets or social groups. Thus, some tools are provided to understand the adoption and use of NPS, which are especially useful in educational situations aiming to support youngsters to make an informed decision regarding the adoption/rejection of NPS consumption and to maintain the rejection over time.

The Roger’s Diffusion of Innovation (or DOI) theory provides a model for spreading a new product or idea over time among members of a social system through certain channels. Thus, it consists of four essential elements: the innovation, the communication channels, time and the social system.

The **innovation** itself is characterized by five attributes that determine the rate of adoption of innovations: relative advantage, compatibility, complexity, trialability, and observability.

The relative advantages represent the degree to which an innovation is perceived as better than the idea it supersedes (economics, functionality, convenience, prestige, and satisfaction). Compared to internationally controlled drugs, NPS have certain perceived advantages, such as being more affordable and, in most cases difficult to detect by drug testing at the workplace, for example. Moreover, they are perceived as legal (they are known as “legal highs”), and sometimes are viewed as “healthier” by the user/ potential user.

The degree to which an innovation aligns with the existing values, past experiences, and needs of potential adopters is known as its compatibility. The social context reflects compatibility with social values. For instance, users may have tried NPS because their social group was also using it, or because they had seen positive depictions of NPS use in various social media platforms, videos, movies, books, and songs. Compatibility with the users’ needs is also reflected in the way the product is marketed to the consumer (the names NPS given on the market are supposed to be cool and playful, their packaging is bright and colorful, etc.).

Complexity refers to the perceived difficulty of understanding and using an innovation: the easier NPS are to use, the more appealing they are to potential users. But some complex products may appeal to users as they may suggest higher quality, novelty or advancement. On the other side, complex formulations of NPS may diffuse slower due to the time and effort it takes to use the product.

The availability of the product plays an important role (e.g. Mephedrone became rapidly diffused at a time when MDMA and cocaine were not easily available). But just because an NPS is easily available does not mean it will diffuse easily; for example, if it has a lot of side effects, the diffusion will be slow. As NPS are easily available, they can emerge - often rapidly - in any place.

The ease of purchasing NPS in stores and/or online is a measure of accessibility. Usually, NPS are the more accessible alternatives to their illegal counterparts, but this does not always mean that the NPS diffusion is high. In the context of accessibility, the internet plays an important role. The access to NPS over the internet is 24 hours a day, it is private, anonymous, and there is a wide selection of NPS to choose from.

Trialability is the degree to which an innovation may be experimented with, on a limited basis. Any innovation comes with an uncertainty level from the perspective of the adopter. But the more trialable it is, the more that uncertainty diminishes. There is likely to be an increase in adoption if there is an opportunity to try a product for free. The trialability of NPS relates to curiosity and experimentation. Experimental NPS use is likely to become more difficult with the introduction of

legislative interdictions as there will be reduced accessibility. Curiosity acts as a motivator for the initiation of NPS use, alongside factors such as boredom and peer pressure. Curiosity as motivation factor is not exclusive to NPS; it also applies to the motivations behind traditional illegal drug use. Whilst curiosity may encourage experimenting; curiosity does not suggest prolonged use. This is likely to relate to other factors such as the severity of negative side effects or desired psychopharmacological effects.

Observability refers to the extent to which the outcomes of an innovation can be viewed by others. The likelihood of individuals adopting an innovation increases with the ease of perceiving its results. Similarly, observing NPS consumption within a unit or group of friends enhances the likelihood of individual consumption, as it fosters a sense of belonging to the group. This serves as an example of utilizing NPS in a recreational or nightlife context. However, the opposite holds true as well. Exposure to the negative effects of NPS diminishes the likelihood of product trial among users. Family, friends, schools and mass media play significant roles in shaping the perception of potential users.

The **communication channels** focus on how information about NPS is spread, involving mass media and interpersonal channels. Of great importance here are social media, online forums, and also word-of-mouth inside friendship networks. The communication channels among the members of these units can serve as distribution channels for NPS and are discussed in the didactic unit 2.

The **time** aspect relates to the period required for the adoption of the innovation, i.e., NPS. This leads to four *categories of individuals*: innovators, early adopters, late majority, and laggards, briefly described in the followings:

The *innovators* typically are young, risk-taking, and have access to information about new trends. In the context of NPS, they are often partygoers, electronic music enthusiasts, or individuals involved in countercultural scenes.

The *early adopters* are opinion leaders who adopt innovations before the majority. They are often seen as trendsetters and have a significant influence on the early diffusion of NPS.

The *late majority* group is skeptical about innovations and adopts them only after they have been widely accepted.

The *laggards* are individuals who are resistant to change and are the last to adopt new ideas.

The **social system** is the network of individuals with shared social and cultural norms influencing the diffusion process. The network structure and the members' age, gender, education, and socioeconomic status influence the likelihood of adopting NPS. Inside the group, opinion leaders and change agents act and influence the NPS diffusion/ consumption.

The process through which an individual (or any other adoption unit) passes from first hearing of an innovation (the knowledge stage) to forming an attitude toward the innovation, to making a decision to adopt or to reject the innovation, to implement the new idea, and to confirm this decision over time. There are five main steps conceptualized within the process:

Knowledge – occurs when the potential users become aware of the innovation’s existence and gain some understanding of how it functions. This is when information (coming from different sources through different channels) regarding NPS and their characteristics is significant. Thus, in order to diminish the chances of NPS adoption, it is important to identify reliable, credible, verifiable, objective, and correct sources of information (subject approached in DU3). It is always recommended to look for evidence-based sources (and preferably to look for scientific sources rather than non-scientific ones).

Persuasion – occurs when the potential user forms a favourable or unfavourable attitude toward the innovation. By gaining knowledge of the NPS characteristics (in terms of “what is good” and “what is bad”) the individual’s attitude can be influenced and consequently his/her decision and behaviour. It is important to recognize the impact that the social system has on this situation. It was found that there are certain reasons that users decided to take drugs: pleasure, enhancement & performance, coping, self-exploration and personal growth, habit, and addiction. This boils down further as reasons to take NPS: the ability to use the products in a safer environment, satisfying a curiosity, facilitating a novel and exciting adventure, coping agents, fostering social bonding, and problematic /unintentional use.

Decision – occurs when the potential user engages in activities that lead to a choice to adopt or reject the innovation. Fundamentally, it refers to the process of deciding whether to use (adopt) the innovation. This module point out the process of making an informed decision.

Implementation – occurs when the individual puts the innovation into use. He/ She tries the innovation, i.e. tries to consume or to resist /does not consume NPS.

Confirmation – occurs when an individual seeks reinforcement of a decision that has already been made, but he or she may reverse this previous decision if exposed to conflicting messages about the innovation. It is the step of reinforcement that the innovation is positive or negative. It is important to understand that once the decision is made, it can be reversed many times, and the process then starts all over again.

Channels for NPS distribution

Globally, the quantity, variety, and accessibility of NPS have increased dramatically. A significant number of new chemicals are discovered every year, thus the market for NPS is expanding.

According to the 2024 EMCDDA Report, (https://www.euda.europa.eu/publications/european-drug-report/2024/new-psychoactive-substances_en), between 2016 and 2022 around 50 products/year appeared on the market for the first time, leading to a record quantity of 30,7 t of NPS in EU Member States. The majority of NPS available in Europe are synthetic drugs made in China and India. These nations' chemical and pharmaceutical industries are capable of producing a wide range of NPS and NPS precursors on an industrial scale and are responsible for the market expansion that has been seen since about 2008. The internet, via online marketplaces, low labour costs, cheap and effective shipping, growing skill and capacity in the science and technology industry, as well as lax regulatory monitoring have fuelled this. The NPS are usually provided as a powder in amounts ranging from a few milligrams to tens or even hundreds of kilograms. For consumers wishing to purchase a certain new psychoactive compound or precursor that is not currently on the market, companies can also provide a custom synthesis service.

Distribution of NPS to consumers takes place either through "traditional" face-to-face encounters (in street markets or the so-called legal shops, vending machines, where products are sold, for example, under the label "legal highs" or dietary supplements) but also through the internet on the surface web and social media as well as on the darknet. The drug forums and online shops are easily accessible through the usual search engines, as well as by social networks (especially those geared towards a younger audience, such as Instagram and snapchat). There are also a number of sites and forums available on the darknet, utilizing cryptocurrencies to further complicate the traceability of NPS buying and selling.

While traditional social media platforms are generally not designed for illicit drug trade, they can still play a role in NPS diffusion by information sharing (about NPS, including their effects, sources, and methods of consumption), marketing (to promote NPS) or even cryptocurrency promotion (often used in darknet market transactions).

Darknet markets (the "hidden bazaar") are encrypted online marketplaces operating on the darknet, accessible only through specific browsers. They are notorious for facilitating the sale of illegal products, including NPS. The darknet markets offer a high degree of anonymity, and a vast array of products; they can be globally reached by connecting buyers and sellers from around the world, using as a preferred payment method the cryptocurrencies.

The proliferation of the darknet use is challenging for law enforcement and brings consumer risks since there is no quality control, and the substances purchased may be mislabelled or contaminated. The ease of access to NPS through online platforms, both on the surface and dark web, can contribute to increased drug use and related harms, developing public health concerns.

Reliable source of information

Nowadays, a lot of information is distributed through a multitude of channels, and the discrimination between what is fake and what is real becomes an extremely important task. This is why, in an educational context, providing reliable sources of information is critical for an effective response in terms of prevention, health protection, treatment, and supply reduction.

A reliable source of information should have:

Credibility – which is linked both to the author (do they have the right qualification and experience in the subject matter?), and also to the publication (is it affiliated to a reputable institution?)

Objectivity – the source should offer a balanced perspective, not only a one-sided one; it should be free from bias or prejudice. It is to be noted that the information should never be presented in a subjective or sensationalist way.

Verifiability – both of the source and the information. Can the information be verified through other sources? Does it provide clear references (citations) to other sources?

Relevancy – to the subject of discussion, which again needs to be viewed from an objective point of view.

Correctness – the information should be based on scientific research, the source should provide evidence to support its claims.

Actuality – which is particularly important in emerging or continuously evolving fields, such as NPS. The information has to be up-to-date, and the date of publication or of the latest update has to be checked.

Website domain – when internet is used, the domain should be considered. Domains such as .gov, .edu, .org, .com are recommended, since government and educational websites are generally more reliable than commercial ones.

One of the most accurate and reliable sources regarding the NPS is the European Monitoring Centre for Drugs and Drug Addiction platform. Here one can find factual, objective, reliable and comparable information at European level concerning drugs and drug addiction and their consequences.

A topic for information must be the legislation regarding NPS and drugs, in general, both at a national and European level. Usually, the national legislation is derived from the EU one, but there are cases when more severe restrictions are imposed. The official sites providing information about legislation, policies and strategies at EU and international level are also recommended sources.

In addition, The United Nations Conference for the Adoption of a Single Convention on Narcotic Drugs can offer important information on the topic at a global level.

By carefully evaluating these factors, one can determine whether a source is reliable and trustworthy.

In this context, educational activities in a regular classroom environment can be driven by objectives focusing on prevention, reducing or ceasing NPS consumption. Diffusion is a particular type of communication involving information exchange about new ideas or products, NPS specifically. Communication regarding NPS takes place both through interpersonal channels as well as through mass media (press release, movies, songs, books, etc.). The mass media channels are usually responsible for creating initial awareness of the innovation, while interpersonal channels are effective at forming or changing attitudes towards the innovation (to adopt or to reject it). Interpersonal channels include offline friend networks but also online forums and communities.

Mass media (which includes newspapers, radio and TV broadcasts, the internet, etc.) can disseminate information effectively at a high speed to a large number of people. Mass media can possibly change “weak attitudes”, but it will not be so effective in convincing people to accept an innovation because it is too impersonal. The main channel of information has now become the internet, but finding a credible source of information has never been harder. Usually when reports on NPS are made, they are sensationalist and focus heavily on the legal and criminal punishments but less on the harm to human health.

Interpersonal channels are the “dominant mechanism for diffusion”. People typically access information about NPS and diffuse products through friendship groups. Thus, the feeling of belonging to a group can be a strong motivation for NPS use, as well as a coping mechanism.

On-line social networks can be seen as interpersonal communication networks because they offer a sense of belonging to members of a social system and emotional support. In relation to DOI theory, the internet acts as a communication channel but also as a social system. Online drug forums online comprise users sharing personal experiences, blogs, documents, news and private messages. Users tend to distrust scientific literature, leading to a greater emphasis on the personal experiences of

other users. Because NPS are labelled “not safe for human consumption”, there are no details given about their ingredients or the dosage or method of administration, so, again, the shared experience of users online can be an indicator of what is considered a safe use of NPS. However, it is crucial to consider the source of the information. People tend to trust those they feel close to or look up to. The role of opinion leaders and agents of change is extremely important in this case.

It is important to note that the on-line communication channels have seen a great increase in the last few years and especially during the COVID pandemic. This applies both to the channels of communication about NPS as well as the distribution channels. While it was found that during the initial stages of lockdown, consumption of NPS decreased, once restrictions were lifted, consumption increased again, even surpassing the initial baseline. Moreover, the NPS market is expected to go through an intense digitalization period.

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Module 4: Meanings of consumption

Motives for classical and novel psychoactive substances

According to Norman Zinberg (1986), drug use can be conceived as a human behaviour connoted by intentions, learnings, and cultures. As in the case of alcohol, the spread of social norms and rituals allows most drug users to engage in drug use that is defined as 'controlled', that is, compatible with their social lives. Zinberg claims that three factors must be considered to understand substance use:

The drug itself, with its pharmacological characteristics influencing its effects on the body, which can vary depending on the dose, administration route, and other factors.

The set, which includes the psychophysical characteristics of the individual taking the substance, including their expectations about its effects, motivations leading them to take the substance, emotional state, personality, and past experiences.

The setting, which refers to the physical, social, and cultural environment in which the substance is consumed. This factor includes not only the physical location, presence of others, music, lighting, and other environmental elements but also the contexts in which informal social rules and rituals are created and shared, which act as elements regulating consumption, making it 'controlled'.

According to Zinberg's theory, it is through the interplay of these three factors that we can interpret and understand the characteristics and dynamics of drug use.

Before the 1970s, the prevailing paradigm concerning substance use was shaped by a moralistic perspective that regarded illicit drug use as inherently detrimental and inevitably leading to psychological or physical dependence. In contrast, Zinberg's new framework shifted the emphasis away from the characteristics of the substance alone. Instead, he underscored the importance of both the context in which drug use occurs and the individual user. Therefore, he shifted the focus of intervention, viewing the user as a **decision-maker** and considering consumption as a behaviour shaped by the beliefs, expectancies, and motivations that the consumer holds about drugs.

Expectancies refer to beliefs about the behavioural, physical, cognitive, and emotional effects of substance use. They answer the questions: What do I anticipate about the effects of the substance? What is my mental representation of the 'after-intake' experience?

Expectancies can be positive or negative. In the case of alcohol, high positive expectancies correspond to higher alcohol consumption, while high negative expectations are related to lower alcohol consumption. Expectancies are important because they are **distal risk factors** and play a key

role in influencing the relationship with the substance, especially in people who are drug-naïve and/or at ages when experience with substances has not yet stabilised.

Motivations are the evaluations people make based on the specific affective states they wish to achieve, which can motivate them to drink (or, conversely, avoid drinking). Research has consistently shown that drinking motivations are stronger predictors of binge drinking behaviour than expectations about alcohol consumption. Therefore, they are considered **proximal risk factors**.

Cooper (1994) identified **four categories of drinking motivations** among young drinkers, which various authors later adopted to investigate motivations related to other types of substances as well:

Enhancement motives, which refer to drinking to enhance positive affective states.

Social motives, which refer to drinking for social facilitation, aiming to enhance socialisation and create a 'party atmosphere'.

Coping motives, which refer to drinking to escape, avoid, or regulate negative emotions.

Conformity motives, which refer to drinking to fit in with a peer group or to avoid social problems. Unlike social motives, these people drink not out of personal preference but to conform.

Each of these four motivations is characterised by a source (which can be internal or external) and changes in affective state (which can be positive or negative). Enhancement and social motives are both associated with a positive affective state, but they have different sources: the former has an internal source, while the latter has an external source. Conversely, coping and conformity motives are associated with a negative affective state, and while the former has an internal source, the latter originates from an external source. Internal and psychological motives, especially **coping motives**, are related to higher risk.

Adolescents are often unaware of their motivations for substance use and, thus, perceive themselves as having little control over the process. Bringing adolescents' motivations to awareness is important because it helps them understand that **substance use is a choice**, thereby allowing them to truly exercise that choice.

Focus on NPS consumers

Consumers of new psychoactive substances (NPS) typically exhibit higher levels of sensation-seeking and impulsivity. They tend to have more peers who use substances, have lower levels of risk perception, and engage in more risk-related behaviours than both non-drug users and illicit drug users. The Internet and social networking sites significantly influence the marketing and distribution

of recreational and prescription drugs. Consequently, NPS consumers are often avid users of online platforms, using them to minimise the impact on their professional or work-related status.

As previously mentioned, expectancies and motivations play a key role in drug consumption, and this holds true for NPS as well. However, specific types of **NPS are linked to different expectancies and motives.**

When examining **expectancies related to NPS use**, research has shown that individuals who use hallucinogenic NPS often anticipate experiencing greater self-exploration or spiritual insights (Benschop et al., 2020). Those who use synthetic cathinones generally expect to gain increased self-esteem, sociability, empathy, or energy (Karila et al., 2015; Winstock et al., 2011). Those who use synthetic cannabinoids tend to anticipate experiencing euphoria, heightened creativity, relaxation, and a sense of well-being (Spaderna et al., 2013). Tryptamines are frequently chosen by those seeking psychedelic experiences, while piperazines are expected to induce heightened energy, euphoria, or mild hallucinations (Schifano et al., 2015).

The **motives related to NPS use** are similar to those related to the use of other legal or illegal substances. Like other drugs (Cox & Klinger, 1988), psychological motives related to NPS use can determine the final decision whether or not to use different types of NPS and, thus, may be the most relevant **proximal factors** influencing NPS use (Benschop et al., 2020). The intrinsic motives for NPS use often include curiosity, the pursuit of pleasure, experimentation, self-exploration, and escapism (Barnard et al., 2017; Benschop et al., 2020; Bonar et al., 2014; Corazza et al., 2014; Kapitány-Fövény et al., 2015; Lauritsen & Rosenberg, 2016; Orsolini et al., 2015; van Amsterdam et al., 2015). Additionally, some motives for using NPS have been found to overlap with the four drinking motives identified by Cooper's model (1994).

Studies such as Benschop et al. (2020) have shown that **different types of NPS are linked to distinct patterns of motivational factors.** The use of synthetic cannabinoids is associated with more pronounced coping motives and less enhancement and social motives. In contrast, the use of NPS stimulants is associated with stronger enhancement and social motives and weaker expansion motives. The use of psychedelics is primarily associated with higher expansion motives and lower coping, social, and conformity motives. Lastly, the use of dissociatives is associated with increased coping and expansion motives. Individuals **at higher risk** are those who are predominantly motivated by strong coping and conformity motives, using NPS as a tool to escape their daily problems (Benschop et al., 2020).

Other reasons related to NPS use include the search for cognitive enhancement, creativity, pleasure, self-medication, and the desire to seek a new and attractive experience. Additional external motives associated with NPS use are lower costs, legal status, desire to avoid detection in drug tests, and easier (online) accessibility (D'Angelo et al., 2017; Simonis et al., 2020; Soussan et al., 2018; Sutherland et al., 2017).

Different motives may have **different trends over time** (Sutherland et al., 2017). Individuals who use NPS for 'opportunistic' reasons (e.g. lower costs and legal status) often reduce their use over time. In contrast, those who use NPS for their desirable characteristics, such as cost-effectiveness, short duration of effects, or perceived higher quality (e.g. greater purity), tend to increase their use over time (Sutherland et al., 2017).

Meanings of consumption through the lens of sociological imagination

The concept of the sociological imagination was coined by the American sociologist C. Wright Mills in 1959. This concept might be used as a didactic pedagogical strategy to help students draw connections between their life experiences and the broader social environment. Sociological imagination helps students develop analytical and critical thinking skills while also assisting them in understanding their context, such as school. Through sociological imagination, students can explore how their personal experiences connect with broader social realities, enriching their understanding of the world. This approach emphasises immersing students in communal processes and environments beyond the classroom, recognising that social theories are simplified reflections of more complex realities (Hironimus-Wendt & Wallace, 2009). Pressing public issues like increasing wealth inequality, deviant behaviour, and mental health become far more meaningful when students can personally identify with them. Therefore, sociological imagination empowers students to think beyond their own experiences, linking them to broader societal dynamics and fostering a deeper, more critical engagement with the world around them.

How students' unique experiences relate to the broader social situation can be explored through sociological imagination. Through dialogues, students can understand the social world and how broader structural forces affect their experiences more fully. This strategy provides a secure environment where students can examine their ideas and views and have critical conversations with others. Practical strategies for implementation across diverse subjects are discussed, emphasising their potential to empower school-age students as agents of social change amidst contemporary challenges (Jones, 2024). As such, sociological imagination improves the ability to look beyond one's personal experiences and establish connections between those experiences and broader societal forces.

By examining the societal factors that influence NPS use, sociological imagination can help understand it. NPS use is a complex subject, and it is essential to consider the impact of poverty and other societal problems. The elements that affect drug use at the individual level, such as mental health conditions, peer pressure, and a lack of resources, must also be considered. We can better understand how NPS use arises and how to effectively handle it by examining the interplay of personal, cultural, and structural elements. Finding alternatives to NPS use requires imagining a society that works for all of us.

Sociological imagination in action

Sociological imagination is a tool that allows people to connect their personal experiences with broader social issues, uncovering the connections between individual lives and larger societal dynamics. Applying sociological imagination allows us to see that broader social, economic, and cultural forces often influence personal challenges rather than them being solely the result of individual actions or failures. This perspective helps to deepen our understanding of societal patterns and issues.

Extreme levels of economic inequality are a long-standing concern for sociologists. Individual experiences are shaped by broader forces like globalisation, technological change, and government policies rather than only individual actions or failures, especially in unfavourable economic conditions. Understanding these patterns deepens our insight into changing social inequalities (Edwards, 2002) and the structural factors that drive inequality (Jacobs, 2021).

Moreover, the complex relationship between 'public issues' like unemployment and mental health is influenced by both social and individual factors. The psychological impact of unemployment extends beyond those directly unemployed, affecting a broader population. Consistent with this, the inadequacy of current interventions and dominant psychological theories in addressing the mental health issues associated with unemployment has been questioned (Fryer, 2002). A rethinking and redesign of employment conditions and unemployment interventions are needed to effectively mitigate these problems, emphasising the need for a broader, more innovative approach to understanding and addressing the psychological costs of unemployment (Fryer, 2002). Through the sociological imagination, we can see that larger economic trends, such as a recession, can influence unemployment by reducing job availability. These structural factors demonstrate how personal experiences are often influenced by broader societal forces.

Similarly, Bonell et al. (2013, 2016) advocated for an integrated perspective to address the influence of school environments on student health. This approach uses ecological systems and social learning theories to capture various aspects of the causal pathways between school environments and

student outcomes. Using sociological imagination when examining the use of NPS among students allows us to move beyond viewing drug use as merely a personal choice or deviant behaviour. Instead, it encourages us to explore how broader social, environmental, and structural factors within schools may contribute to such behaviours.

These examples reflect how sociological imagination enables us to see the connection between personal experiences and larger social structures, helping us to understand that our individual lives are intertwined with the world around us. By adopting this perspective, we can better understand societal patterns, recognise the influence of larger forces on our lives, and contribute to meaningful social change.

The sociological imagination and the meanings of consumption

The sociological imagination allows us to understand the meanings of NPS use by connecting individual behaviours and choices with broader social, cultural, and economic contexts. NPS use can be understood as part of broader cultural and social trends. For example, their use may be linked to a desire for novel experiences or a means of social bonding and belonging as users seek to explore new sensations or enhance social interactions. This stance reflects how cultural norms and peer influences shape individual choices. The availability and use of NPS are influenced by economic factors and legal ambiguities (Santos et al., 2024). These substances are often marketed as 'legal' alternatives to controlled drugs, making them more accessible to people who might otherwise avoid illegal substances. Sociological imagination helps us see how economic and legal structures impact drug availability and consumer behaviour. The lack of regulation and unknown composition of these substances often exacerbate the health and social risks associated with their use. Understanding these risks through a sociological lens highlights the role of systemic issues, such as inadequate public health responses, and the challenges of regulating rapidly evolving drug markets. Some people, particularly those living in challenging economic and social conditions, may resort to NPS as a coping mechanism for addressing social, economic, and financial difficulties. Sociological imagination allows us to see how structural inequalities and social exclusion contribute to NPS use.

By applying sociological imagination, we can better grasp the complex interplay of individual choices and societal factors that drive the use of new psychoactive drugs, leading to a more comprehensive understanding of this phenomenon.

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Module 5: Representations of substances abuse in mainstream channels

Use and abuse of substances over time

For millennia, humans have consumed drugs to achieve certain desired physical or mental states. Drug use is a common practice across different societies and eras, serving to alter physical and mental states. It is nearly universal in its prevalence globally and historically (Goode, 2008). Early humans found that certain plants induced relaxation, drowsiness, peace, or happiness. Others provided a boost in energy, alertness, or stamina. Some plants also led to strange sensations, visions, or altered consciousness (Gahlinger, 2004). From the use of ephedra (an herbal stimulant) during Neanderthal, to the role of Betel seeds 7000 years BC (chewed for their stimulant effects) as found in archaeological sites in Asia, or the use of psychoactive plants during the Dionysian rites and the mysteries of Eleusi in the time of Greeks and the Roman Empire (Bragazzi et al., 2018), drugs have always been present in human history in all continents and societies.

“In most cultures throughout history, only a small number of drugs were in common use. The remainder were not explicitly forbidden; there was no need, since they lacked the cultural framework to make them desirable. (...) The prohibition of drugs in the twentieth century had its roots in a (...) reaction against cultural decadence. A hundred years ago, many of today’s illicit drugs were available in any high-street chemist. (...) Alcohol, and intoxication in general, was a clear and present danger: an offense against the sovereign spirit of reason and an invitation to disorder and self-destructiveness. (...) These social contradictions were projected onto dangerous objects of consumption, such as drugs and alcohol, creating taboos around their use” (Jay, 2010).

Opium (morphine and heroin are a derivative) was widely available in the 19th century, sold by barbers, tobacconists and stationers. Opium had various uses, including relieving toothaches, bruises, coughs, and diarrhoea. The working class used it as a stimulant before work, while mothers

used laudanum to calm babies. It was common to smoke opium in coffee shops or use it with children. Initially considered “respectable” for the middle class, opium’s spread to the working class raised concerns about abuse contributing to their “degeneracy”. In addition, opium became linked with Chinese immigrants, sparking public fear and xenophobia, especially regarding the corruption of white women by foreigners (Berridge, Edwards, 1987; Ng, 2016).

Cocaine originates from the coca leaf and dates back to Inca traditions in the 16th century. Spanish explorers observed Incas chewing coca leaves for euphoric effects. They used coca to control and exploit the indigenous population (Brecher, 1972). In the 19th and 20th centuries, cocaine was used for various medicinal purposes, including treating depression, obesity, and asthma. Sigmund Freud, in 1884, noted the stimulating effects of cocaine in his essay “Über Coca”, in particular the suppression of fatigue and hunger. Cocaine gained popularity among intellectuals for enhancing creativity and critical thinking. Even fictional characters like Sherlock Holmes were depicted as users of cocaine for its perceived benefits.

Cannabis has been used for therapeutic purposes in the East since the third millennium BC, as evidenced in the Nei-Ching text. It was used to treat various ailments such as diarrhoea, bronchitis, migraine, insomnia, appetite, and nerve disorders. In India, cannabis was mentioned in the sacred Vedas texts in the second millennium BC, symbolizing the demon Vide-Vadat and promoting ecstasy. Known as bhang, cannabis holds religious significance in India as a favourite plant of the god Shiva (Bragazzi et al, 2018). In the Western world, cannabis was used for medical treatments and cultivated for fibre and textiles in the 19th and 20th centuries until its commercial cultivation declined after World War II due to decreased demand for natural fibres.

The role of (mass) media

The use of the substances just described is visible in the paintings, decorations and advertisements of the time, as well as in the literature. Mass media have always played an important role in defining our culture and our behaviours (Gitlin, 1990): as communication channels, they disseminate news, music, movies, education, promotional messages and other data. And we learn, in an informal way, through offline and online media. In the early 20th century, mass media technologies like radio and film were believed to have a strong influence on shaping audience beliefs and behaviours. The theory assumed audiences were passive and uniform, without empirical evidence but based on assumptions about human nature. This perception was fuelled by the rapid spread of broadcasting technologies into ordinary homes and the use of propaganda during wartime to unite populations. Early research focused on the power of propaganda in influencing public opinion. The

prevailing view was that mass media held immense power due to their ability to reach a wide audience. In the 1930s, media effects studies focused on empirical research, showing how individual differences in the audience influence the impact of media. Researchers explored persuasion effects and the use of planned persuasion in different media, considering variables like demographics, social psychology, and political interest. In the 1950s and 1960s, television had a significant impact on social lives. Researchers found that early studies focused too narrowly on short-term effects using psychological models. The “stimuli-reaction” model raised awareness of long-term media effects. A shift towards studying long-term effects led to more research on collective cultural patterns, social reality definitions, ideology, and institutional behaviour. Despite audience control over media selection, the way media shapes content can influence long-term consequences. In the late 1970s, researchers explored how the media influences social realities (social constructivism). This approach focuses on how the media shapes meaning and corresponding social norms. Audiences interact with media-created realities to form their perceptions of actual social conditions and their place within it. Individuals can choose to accept or challenge these constructs, drawing from various sources like personal experiences or cultural influences (McQuail, 2010). Research on individual and group behaviour in computer-mediated environments dates back to the 1970s. Early studies focused on how computer-mediated communication (CMC) affected social interactions due to its restrictive nature, such as anonymity and lack of nonverbal cues. The evolution of CMC research in the 1990s examined the impact of the internet on personal use, leading to the development of theories like social information processing and the social identification/deindividuation model, comparing CMC effects to face-to-face communication. Dynamic user-generated content on websites and social media platforms has further expanded research in this area (Valkenburg, Peter, Walther, 2016).

The media significantly influences public perception and behaviour towards substance use. Depictions of drugs, alcohol, and tobacco in various media sources contribute to both stigmatization and glamorization of substance use disorders. The direct impact of popular media on substance acquisition and use is particularly concerning, especially among young people. However, the media can also be a powerful tool to change individuals’ perceptions and behaviours towards substance use. By understanding and utilizing the influence of the media, interventions can be developed to promote healthier attitudes and behaviours surrounding substance use (Louka, 2023).

Sex, drugs and rock’n roll

In more recent times (XX century), rock performances are often associated with disruptive behaviours throughout history, from cinema seat destruction by Teddy Boys to the hippie events of

the 60s. Reggae, blues, rock, beat, and house music have all been intertwined with drug culture. This connection between music and youth experiences is reflected in the lyrics and videos of many artists, such as The Beatles, The Rolling Stones, Neil Young, and The Doors. Music has been a vehicle for expressing freedom, experimentation, and rebellion, capturing the essence of societal issues and individual experiences. The impact of music on youth culture is evident in the themes of practices and consumption present in various genres (Hebdige, 2004; Vuolo et al., 2013; Calado, 2007; Martins, 2019). Authors of musical works often promote drug use in their lyrics, similar to representations in films. In the late 20th century, concern arose that adolescents' musical preferences could lead to risky behaviours, like drug use. This trend continued into the new millennium. Recent studies show a significant rise in drug references in popular music lyrics, associating drug use with wealth, pleasure, and socializing (Motyka & Al-Imam, 2021).

Alcohol and cigarettes were commonly depicted in films before 1950. Drug representation in movies was originally linked to illegality, user destruction, and societal destabilization. However, in the 1960s, influenced by youth subcultures, drug portrayal became more intricate. Films like *Easy Rider* (1969) and *Nine to Five* (1980) showed alternative views of drugs, sometimes associated with rebellion or entertainment. *American Beauty* (1999) depicted marijuana use across various ages, contrasting the destructive depiction of heroin in films like *Apocalypse Now* (1979) and *Scarface* (1983). Cocaine was often portrayed as a consequence of capitalism and the desire for success in movies like *Bright Lights, Big City* (1988) and *Light Sleeper* (1992). Films like *Trainspotting* (1996), *La Haine* (1995), and *Fear and Loathing in Las Vegas* (1998) presented drug use without moral judgment, aiming to show the reality of drug abuse (Markert, 2013). Castaldelli-Maia et al. (2021) analysed 47 Oscar-nominated films from 2008-2011 to study drug representation. Films showed 515 drug use scenes, often as response to stress. Increase seen in non-alcohol, non-tobacco drug scenes and simultaneous drug use, especially by women. Researchers suggest films reflect societal drug trends, influencing viewer behaviour. Top-rated digital streaming platforms like Netflix, Hulu, and HBO Max feature popular shows like *Breaking Bad*, impacting drug perceptions.

Conclusion

Mass media shape adolescents' behaviour, with exposure to drug-laden content in film, music, literature, websites, and products influencing risky behaviours. They can either promote healthy habits or encourage harmful actions. Pop culture products, like music lyrics and online content, play a crucial role in promoting liberal and pro-drug beliefs. Films, books, and public figures who openly discuss drug use further contribute to shaping attitudes towards drugs. These influences highlight the importance of popular culture in affecting drug-related behaviours (Motyka & Al-Imam, 2021).

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Chapter III. New Psychoactive Substances (NPS) – A Blended Learning Course for Teachers and Students

Stefano D’Ambrosio

Within the framework of the “Ines project”, the course "New Psychoactive Substances (NPS)" has been developed to provide a comprehensive understanding of the dynamics associated with emerging psychoactive substances. The Online Blended Learning course focuses on their classification, toxic effects, dissemination channels, and the underlying motivations for their use. Structured as a blended learning pathway, the course integrates digital resources, interactive activities, and moments of critical reflection, offering a modular learning experience primarily aimed at educators and students.

The course adopts an innovative and multidimensional pedagogical approach grounded in the principles of active learning. This educational model is distinguished by its integrated and flexible structure, which effectively combines blended learning methodologies with a multidisciplinary perspective.

The fusion of e-learning elements with in-person activities optimizes the advantages of both modalities, combining the flexibility and accessibility of online learning with the direct interaction and engagement typical of traditional classroom settings. This synergy between different teaching modalities fosters a richer educational experience, adaptable to the individual needs of students.

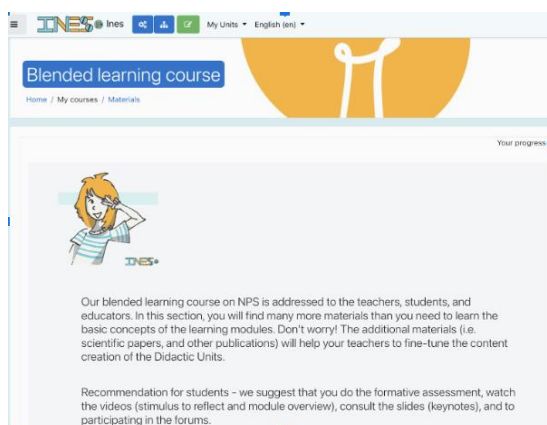


Figure III. 1. Introduction to Blended Learning Course (Screenshot).

The course's multidisciplinary approach, which spans from the scientific classification to the social representation of New Psychoactive Substances (NPS), promotes a comprehensive and multifaceted understanding of the phenomenon. This interdisciplinary framework encourages critical thinking and the ability to establish connections between concepts from different fields of study. The proposed activities, such as creating quizzes and participating in discussion forums, encourage students to become co-creators of their learning journey. This active involvement fosters a deeper and more lasting understanding of the content, in line with constructivist learning theories.

The contextualization of learning is ensured through the inclusion of materials that analyse the representation of NPS in mainstream media, helping students connect academic learning with the broader social and cultural context. Finally, the emphasis on formative rather than merely summative assessment supports continuous and adaptive learning, aligning with the latest research on the effectiveness of assessment processes in higher education.

The course is organized into five main modules, each exploring a specific aspect of NPS. The blended learning methodology, combining online learning with in-person activities, was chosen to ensure a flexible and adaptable approach to the diverse needs of participants. The modular structure allows students to gradually deepen their understanding of the concepts, with the option to access supplementary materials for a more personalized learning experience.

Classification and categorization

Toxic effects and risk assessment

Diffusion channels

Meanings of consumption

Representation of substance abuse in mainstream channels

Each module, as illustrated in Figure III.2, is structured according to a precise educational framework, comprising several essential components for learning. At the beginning of each module, the authors—experts in the field from various European universities—are introduced, having collaborated in the creation of the content and its specific insights. The module overview, which immediately follows the author's introduction, offers a concise description outlining the content and main objectives, providing students with a clear vision of what will be covered.

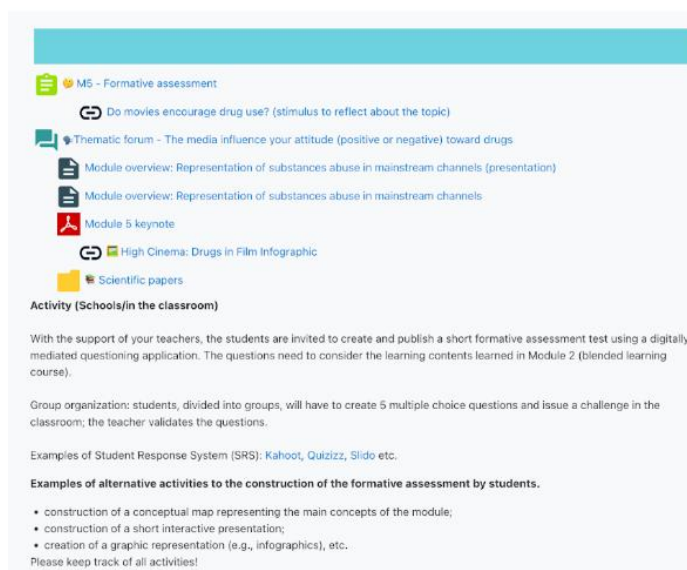


Figure III. 2. Module 5 (Screenshot).

The modules are further subdivided into Didactic Units (DU), each focusing on specific subtopics to ensure a thorough and targeted exploration of the subjects. The educational tools employed include various materials designed to support and enhance learning. Among these, formative assessment quizzes play a crucial role in verifying students' understanding, while stimulus videos are designed to introduce the topics engagingly, fostering critical reflection.

Additionally, the thematic forum, characterized by a "Big Question," provides a space for discussion and exchange among students, facilitating dialogue and the sharing of ideas. For those wishing to delve deeper into the topics, additional learning resources are available, including scientific articles and other relevant publications. Finally, each module proposes a practical in-class activity, which generally involves creating a brief formative assessment test using digital tools such as Kahoot, Quizizz, or Slido.

Alternative activities, such as constructing concept maps, interactive presentations, or infographics, are also suggested to offer students further opportunities to consolidate and apply the acquired knowledge.

The course is designed to be flexible and adaptable to different educational contexts. Teachers can use additional materials to customize and deepen the Didactic Units. Students are encouraged to complete the formative assessment, watch the videos, review the slides, and participate in discussion forums.

Final Considerations

The course on "New Psychoactive Substances" represents a comprehensive educational experience that combines theory, practice, and critical reflection. The choice of a blended format responds to the need for flexibility and personalization in learning, while the modular structure facilitates the progressive deepening of the topics covered. This pedagogical approach aims to provide technical knowledge and develop critical thinking and social awareness among participants.

Chapter IV. Visual Novels and INES Project

Alessandro Soriani,

Frédéric Mignon, Thomas Henrion, Fabian Andry

The Power Storytelling and Digital Storytelling

By: Alessandro Soriani

The relationship between humans and storytelling is a long one, which has laid its foundations since the dawn of the appearance of our species. Various scholars such as Bettelheim (1976), Bruner (1986) or Nash (1990) have emphasised the undeniable value, both in cultural and pedagogical terms, of the act of storytelling. This act is not only an activity that has profoundly marked the course of human history but also represents a privileged medium through which children encounter the world and surrounding reality (Levorato, 1988; Pinto, 1993). Stories and narratives serve as a gateway to a wide range of learning, ranging from language acquisition to understanding the world, and play a fundamental role in helping children learn about themselves, contributing to the construction and consolidation of individual identity (Bocci & Franceschelli, 2014).

In recent decades, the widespread use of technology, also in education, has given rise to new forms of storytelling, leading to the emergence of an approach known as Digital Storytelling (DST).

Robin (2020), defines digital storytelling as the practice of using digital tools to tell stories. The author reminds us that, although many terminologies can be found in the literature to describe this practice (digital documentaries, computer-based narratives, digital essays, interactive storytelling are just some of the nomenclatures that can be found), they all refer to the concept of combining the art of storytelling with the potential offered by technologies (such as multimedia, distribution channels, expressive and collaborative possibilities). According to Porter (2005), DST represents an emerging form of personal and authentic expression that involves individuals and communities in reclaiming their culture and exploring creativity.

Several figures in the pedagogical field have dealt with this topic, demonstrating that the integration of digital storytelling into teaching and educational practices can contribute to several objectives:

- Maintaining high student motivation and interest in learning (Bredvick, 2016; Robin, 2008; Sadik, 2008; Sylvester & Greenidge, 2009; Yang & Wu, 2012);
- Facilitating the acquisition of concepts (Boase, 2013; Clark & Medina, 2000; Hall, 2001);
- Reinforce individual identity (Kervin & Mantei, 2011);
- Enhancing narrative skills and stimulating creativity (Cassell & Ryokai, 2001; Morgan, 2014);
- Fostering critical thinking (Bertolini & Contini, 2018; Wu & Chen, 2020);
- Stimulating interpersonal and teamwork skills (Baschiera, 2014; Di Blas et al., 2012; Nam, 2016);
- Developing social skills (social skills) and life skills (life skills) (Hancox, 2011; Kervin & Mantei, 2011; Malita & Martin, 2010; Niemi & Multisilta, 2016);
- Enhancing media literacy and digital skills (Contini et al., 2015; Yuksel & Robin, 2011).

In summary, it can be said that Digital Storytelling, when integrated with a clear pedagogical objective centred on the real educational needs of children and young people, represents a powerful and flexible tool that lends itself effectively to different educational contexts (formal, informal and non-formal) (Soriani, 2024a).

Digital Storytelling for Educational Contexts: Which Competences?

By: Alessandro Soriani

Educational design based on Digital Storytelling results in the need to combine areas of knowledge: pedagogical, technological, content-related (Mishra & Koehler, 2006) and narrative knowledge.

Technological knowledge concerns the conscious and competent use of technologies in the different phases of the activity: from the identification of needs to the moment of evaluation. Not only that, but also the activation of these skills in those with whom one is working. Even if today, thanks to the presence and use of dedicated software, it is possible to carry out audio-video editing or video game construction activities in a much easier and more immediate manner than in the past, the issue of digital skills is not secondary when talking about digital storytelling. It is therefore important to undertake training in digital skills (European Commission. Joint Research Centre., 2022; Redecker & Punie, 2017) of audio-video editing and the construction of interactive multimedia products.

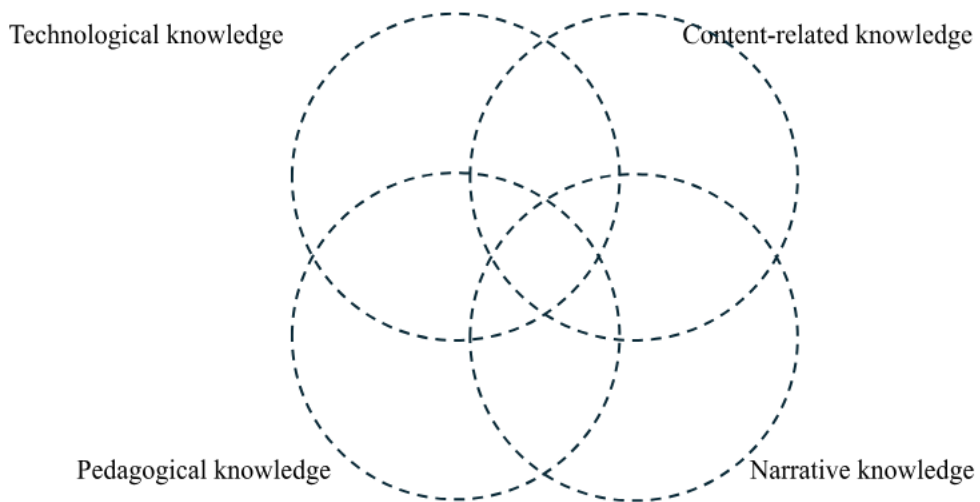


Figure IV.1. A model for educational design based on Digital Storytelling (Soriani, 2024a).

Content-related knowledge involves possessing an in-depth knowledge of the content dealt with by digital storytelling and addressed in the DST activity. In order to tell something well, one must first know it and, the magic of storytelling, telling something helps one to understand it better.

Pedagogical knowledge is about the rigorous design of a sound and well-thought-out DST-based instructional design. This means:

- carrying out an analysis of the context and educational needs of the targets of the DST activity;
- identifying the educational objectives to be achieved;
- drafting a design that takes into account the characteristics of the subjects, their experiences, their skills and that is focused on the identified objectives;
- design a moment of reflection – so called debriefing - together with the subjects on the activity carried out;

- implement the activity, giving space and equal opportunities to all the subjects and monitoring its development;
- set up an activity evaluation process - with the identified objectives in mind - aimed at understanding the aspects that worked and those that need to be improved.

Finally, Narrative knowledge concerns knowing how to conceive a story, how to tell it, how to choose which channels to use to convey it and which languages to use to best reach the intended audience. It is important in this sense not only to have developed similar skills, but to be able to stimulate and exercise them with the subjects with whom one works in the educational intervention. The Centre for Digital Storytelling at the University of Berkley, California, has formulated seven basic principles to assist educational professionals in initiating projects involving storytelling through digital media:

Point of View: Identifying the perspective from which the story is told, as well as identifying its objective is an essential first step in designing a narrative that enhances the experiences of the storyteller you wish to highlight.

Dramatic question: it is important to formulate a key-central question, with strong emotional significance, around which the entire narrative is built. Identifying the right question and presenting it appropriately is the key to attracting and maintaining the attention of the audience and providing a solid basis for the narrative.

Emotional content: this principle concerns the introduction into the narrative of content with strong emotional relevance, capable of reverberating in the emotional experiences of the audience. The authenticity of these emotions is crucial to give the children, who create or enjoy that content, the feeling of authenticity and relevance to real issues, which affect them personally.

Power of voice: In audio-visual narratives, the use of voice is a powerful tool to engage the audience and clarify the plot. This can not only enrich the directing aspect (through the inclusion, for instance, of a voice-over verbalising not so obvious aspects of the story), but also help to convey messages or content by providing vocal support to visual elements. Be careful not to abuse this component too much, however: many narratives are based precisely on the free interpretation of what is staged by the audience, and always providing overly didactic explanations could defuse their power.

Power of music and sounds: the use of sounds and music in a digital narrative makes it more effective and authentic. Finding the right sounds and music is an effort that greatly enhances the technical and artistic experience for those creating the content.

Economy: paying attention to the economy of a narrative means communicating a story while striving to use as little content as possible, optimising production work and enjoyment. Selecting what is essential from what is superfluous is a very difficult operation that requires a great exercise in discernment and critical thinking and pushes content creators to rethink the way they tell their stories.

Pacing: the rhythm with which the narrative is told can be more or less pressing and more or less uniform. Understanding how to manage rhythm in a multimedia narrative is a very lofty and very complex objective that can, however, stimulate young people to embark not only on a path of self-assessment of the quality of their work, but also on a path of acquiring greater awareness of the stories they themselves enjoy.

Of course, the creation of digital stories presupposes a series of attentions that educators and educational professionals must ensure. In this regard, as part of the STORIES project (foSTering early childhOod media liteRacy competencIES), some guidelines on the use of digital narratives in educational contexts have been drawn up. The authors list five attentions that those who coordinate such activities should maintain (Gariboldi & Catellani, 2013):

- organise time appropriately in order to leave subjects engaged in DST activities free to think, create and revise their products;
- provide working spaces within which subjects can feel supported in their creative processes and where they can feel free to act and experiment;
- offer diverse and unstructured materials to enable children to construct and design their own stories;
- support the use of different expressive and artistic languages and registers;
- ensuring the presence of an adult to guide and support the subjects throughout the entire process of designing, constructing and enjoying the stories, maintaining a non-judgmental attitude that is open to their ideas.

Video Games and Storytelling

By: Alessandro Soriani

When talking about storytelling in digital contexts, one cannot but consider the world of video games. The video game medium, from the moment of its birth – which can be identified around the 1950s (Rickards, 2015) – to the present day, has seen a sensational evolution that has affected every aspect of it: distribution platforms, economic models, graphic and sound elements, game mechanics and, of course, narrative mechanisms.

The ways in which different elements – graphics, sound, gameplay, interactions, etc. – are articulated to construct a narrative structure in video games can vary enormously from game to game: there are products in which the story, understood as a narrative plot, is almost completely non-existent, and others in which the narrative is so preponderant as to limit player interaction to a minimum, products in which the mechanics are perfectly integrated with the narrative structure, and others in which stories are told in such experimental ways that would not be possible in other mediums.

Storytelling in video games has been one of the most debated topics in the field of game studies: on the one hand, proponents of a “narratological” approach – among whom we can also mention Henry Jenkins – have focused their attention on the narrative aspects of video games, arguing that they should be analysed and interpreted using the same narratological categories normally applied in other media. On the other hand, there are the “ludologists” – including Aarseth (1997), Bogost (2007), Juul (2001), Madsen & Johansson (2002), Sicart (2008), – who consider the narrative forms of video games not as mere plots told through the classical storytelling tools, but as the outcome of a process of interaction between the player and its mechanics. According to this perspective, video games cannot be read only using the categories of narratology, but it is necessary to consider above all the game mechanics, the rules of interaction and the players' agency.

In reality, the debate between these two factions has never really existed, or rather, the “narratologists” themselves are actually strongly in tune with the theses of their rival colleagues: the discussion developed mainly as an exercise to find the right space for reflection around a medium in constant evolution and to give due recognition to the specificities of a field of study – game studies – that was still young at the time (Murray, 2005).

Henry Jenkins, in his famous article written specifically to build a bridge between the two approaches (Jenkins, 2003), presents four architectures through which video games can structure a narrative.

Evoked narrative: the first is when the design of a video game's space either contributes in building a sense of immersion in familiar worlds for the player, or communicates new perspectives on a particular story through the alteration of specific details of those spaces. In other words, a narrative is evoked when game environments “speak” to the player and “evoke” imaginaries (whether realistic or fantastic).

Enacted narration: the second architecture is articulated on two levels. The first concerns directly acted actions at the gameplay level. By choosing to act in a certain way rather than another, a player

can experience an enacted, acted narrative, different from all the others. The second level concerns the type of interaction that the player operates with those elements that drive the plot forward: it is the player himself who feeds, directly with his action, the pacing of the narrative, now activating scripted sequences, for instance by defeating an enemy or choosing a dialogue option, now lingering on actions that do not activate such sequences (Soriani & Caselli, 2020).

Embedded Narrative: Jenkins defines this narrative architecture as an active process through which players construct hypotheses regarding probable narrative developments on the basis of information derived from graphical cues and textual clues. According to this view, developers can follow two different approaches: one relatively unstructured and more controlled by the player as he or she explores the game space and unlocks its secrets (this is the case, for instance, in *Dark Souls*, where any element of the game world, from a statue placed - or missing! - in a certain place, to the furniture of a particular room, has a strongly rooted narrative sense that 'tells' something about the world in which the story is set); the other is strongly pre-structured but implemented through the staging of the story, waiting to be discovered (Jenkins himself gives as an example the famous *Half Life* where the narrative is integrated with the actions that the player is called upon to perform: traversing buildings, fighting enemies, and so on...).

Emergent narrative: the fourth architecture concerns those situations where the narrative potential is conveyed by the player's ability to customise or create new game elements. For Jenkins, the creation of a house in *The Sims* is not only the creation of a unique space, but also the creation of a new narrative in which the player is the main author and director (Soriani & Caselli, 2020).

Video games can tell stories through narrative constructs from other languages (writing, speech, image, video, sound, ...) but also through the deployment of grammars that exist solely and exclusively within the video game medium: first and foremost, the capacity for interaction, gameplay mechanics or immersion in VR environments.

That said, the characteristics that make a game an interesting product from a narrative point of view are essentially two: "what" is told and "how" it is told (Soriani, 2024b).

Some games stand out for the quality of the stories they tell and that the player can experience. Stories capable of capturing the player's interest and throwing him or her into stimulating and interesting narrative worlds; stories that may prove useful in reflecting critically on the themes addressed and the messages conveyed within them, opening up the possibility of building connections with real historical or current events.

Visual Novels and INES PROJECT

By: *Alessandro Soriani*

One of the focuses of the INES project was to develop a very specific kind of video game about the consumption of NPS: a visual novel.

Visual Novels (VN) can be defined as digital narrative focused games that require “[...] interactions where the player must be able to impact the story world or the story’s progression. The story and interactions are most commonly presented through a text box and often employ additional forms of interaction including menu choices – which often contain sets of actions that the player character can perform – or dialogue options representing the player character’s speech or thoughts. Crucially, VNs have On-Click Progression, where the player clicks, taps or presses a button to see the next part of the story. The aesthetics of VNs are most often conveyed through static images of characters, background art, sound effects (SFX) feedback, and soundtracks.” (Camingue et al., 2021, p. 11).

The experiences of using VNs in educational contexts are many and very well documented (Agusalim, 2012; Faizal, 2016; Gabriel et al., 2018; Grasse et al., 2021).

Camingue et al. (2020) proposed a taxonomy of teaching strategies through Visual Novels by identifying five different categories:

Teaching through choice: this strategy focuses on learning and story progression by staging situations where the player’s character needs to make explicit choices. The main learning driver is the fact that the player is experiencing the effects of his/her choices.

Teaching through mini-games: this strategy emphasizes presenting players with small, contextualized gaming scenarios, enabling them to demonstrate their knowledge of specific topics addressed by the visual novel or to practice activities that reinforce learning.

Teaching through scripted sequences: this strategy emphasizes the utilization of pre-written sequences that necessitate players to execute the specific actions intended by the developer before they are permitted to advance. This approach commonly manifests as interactive cutscenes or in-game quizzes.

Teaching through exploration: this strategy is based on the fact that the player learns concepts through exploration of the game's world. This method relies on self-exploration and often utilises a hidden story structure, requiring players to uncover story content in order to progress. “Players are also typically given additional information, including educational content, about what they discover through narration. As a result, exploration,

in this case, acts as both educational delivery as well as progression through discovery” (ibidem, p. 7);

Non-interactive teaching: this strategy relies exclusively on narration and character dialogues to convey educational contents to the players. Unlike other strategies, it conveys knowledge more passively, with learners receiving information without engaging in activities aimed at learning new concepts or reinforcing existing ones.

In Practice: Storytelling in the INES Context

By: Frédéric Mignon, Thomas Henrion, Fabian Andry

The decision to use an interactive visual novel was based on a preliminary analysis of the main families of video games. Our aim was to identify those that would best suit our audience. But which audience are we talking about? First and foremost, we had to define as precisely as possible the potential audience, their habits and the context in which they consume video games.

Audience, habits and context of video game consumption

In a Serious Game context, the question of the target audience is essential. In our case, this audience was identified: we were targeting teenagers/young adults in the approximate age bracket of 16 to 20.

This is a mature audience in terms of video game consumption.

All that remained was to determine how to engage this audience. In other words, how to keep them captivated by the game long enough for the awareness-raising message to be delivered effectively.

We frequently use a typology of players’ motivational profiles created by Richard Bartle, which enables us to isolate players’ motivations in order to identify the best game types, structures and mechanics to mobilise.

Application of Bartle's typology

Originally created to study the motivation of MMO/MMORPG (Massively Multiplayer Online role-playing game) players, Bartle's typology is based on 4 motivational profiles: the ‘Killer’: highly competitive, the ambition of this profile is to see others lose; the ‘Explorer’: motivated by discovery, this profile explores every nook and cranny of the game world; the ‘Socializer’: motivated by social relationships, this profile especially enjoys interacting with others; the ‘Achiever’: motivated by collecting items, rewards and trophies, this profile likes to complete all the challenges offered to it by the game.

In our case, we are not targeting a specific category of player. In fact, for a Serious Game designed to raise awareness, it's important to cast a wide net and appeal to as many players as possible.

In itself, this is not a real problem. In fact, we know that these motivational profiles are not Manichean: a player is always a bit of all these profiles at once, some being more dominant than others. The motivational profile is never monolithic, it is composite.

So, on the assumption that a player's motivational profile is most of the time mixed, we can try to create a videogame experience that allows room for each of these profiles. But by approaching the problem in this way, by trying to please everyone at all costs, you run the risk of pleasing no one...

So how do we go about identifying the most appropriate type of game for our target audience?

Since the motivational profile approach was not enough to answer this question, we decided to change perspective.

Since the pupils from the schools involved in the project were going to be asked to create game scenarios, we had to identify which type of game and game structure would be most likely to be suitable. And this in a context of collaborative creation by inexperienced people.

Type of game

Adventure, action, RPG, RTS, simulation, etc. How can we identify the most appropriate types of game to use in the INES project? To do this, we analysed the major families of video games, focusing on their main characteristics.

There is now a fairly broad consensus on the classification of video games into major families. Each family has its own characteristics, based on gameplay elements, i.e. the game mechanics and rules commonly used in a family.

Here is a brief summary of the different families of video games we have studied:

Action: a game whose gameplay is essentially based on the player's reflexes and skill. The term 'action game' tends to refer to games based essentially on violent confrontation mechanics (FPS - First Person Shooter; shoot'em up; fighting games). But in reality, action games cover many other types of game, such as platform games, mazes, etc.

Adventure: adventure games focus on storytelling rather than player skill or reflexes. It is characterised by exploration, dialogue and puzzle-solving. Having long been a major genre in the history of video games, the adventure game was then dethroned by the advent of 3D and the success of action, role-playing and strategy games (see below). Since the recent

popularisation of interactive fiction akin to interactive film, adventure games have made a comeback with productions featuring rich, highly accomplished scenarios.

Role Playing Games (RPG): inspired from the principle of tabletop role-playing games, RPGs feature one or more characters that the player must develop through a quest. This (main) quest is often accompanied by a whole series of related missions (or secondary quests), which serve to enhance the skills of the player character(s). The action usually takes place in a vast universe that serves as the backdrop for a complex storyline. RPG games often have a very long lifespan.

Strategy: strategy games aim to achieve a clearly defined objective. This type of game requires the player to think and plan an action to achieve a given objective (strategic or tactical). This type of game mainly concerns battle or war game simulations. It should not be confused with management games, even though the latter also involve questions of strategy.

Management: most often centred on the economic sphere, management games aim to plan and implement management operations to develop and ensure the prosperity of an economic and social structure. While the game mechanics are centred on economic management, it is not uncommon for the player to have to manage a number of external factors (such as ecology, military and geopolitical aspects, etc.).

Simulation: the aim of these games is to give players the opportunity to imitate real-life activities. Without necessarily being systematically realistic, this type of game relies on attention to detail to recreate the handling of machinery, medical or industrial processes, or even specific workflows. Simulation games generally contain very few narrative elements.

Sports: sports games are video games that simulate the practice of a sport. These games are sometimes referred to as simulations, when the aim is to represent the sport as faithfully as possible, or as arcade (action) games, when the aim is to make the sport more spectacular or 'fun'.

Reflexion: enigma or puzzle games, this type of game contains almost no narrative elements. The gameplay is relatively simple, and the difficulty gradually increases as you progress through the game.

Mixed: Mixing genres is a common occurrence in video games. The boundaries between the different categories listed above tend to blur, and it is not uncommon for certain types of game to borrow characteristics from others. For example, action-adventure games, action-RPGs (or tactical-RPGs), sports management games and so on.

There are, of course, many other types of video game, such as music games, horror games (action or action-adventure sub-genres) and so on. Given their specific characteristics, we have not taken these games into account in our analysis.

Most relevant game families

Today, the biggest game design studios are trying their hand at more educational games, playing the storytelling card: complex, immersive scenarios, reinforced by highly developed characters, enable players to identify with and feel genuine empathy for the game's protagonists.

Similarly, to tackle a subject as complex as New Psychoactive Substances (NPS), we felt it was important to draw on the personal experience of each player. To do this, it was essential to put in place an immersive system that would ensure that the player was deeply involved, so as to encourage them to take on board the awareness-raising message.

In the INES project, a game-based approach with a rich storytelling that encourages identification and empathy seemed to be an interesting way forward.

That's why we've set our sights on a type of game that draws on the codes of adventure games and possibly enriches them with certain characteristics of role-playing games (RPGs): an interactive visual novel.

Game structure

So, yes, an adventure-style game. But you still need to identify and mark out a game structure that suits the ambitions of the project.

What kind of game structure would be best for the INES project? A very open and free play structure, or a more closed and framed structure?

As the game was largely going to be scripted by the pupils from the participating schools, it was vital to avoid them getting lost in the meanders of an endless story. In other words, we had to steer them towards a narrative structure that would help them keep their story on track.

To do this, we reviewed the most common game structures to identify the most appropriate one.

Time cave: this game structure is probably the most common in interactive fiction. In this architecture, as soon as a choice is made by the player, it has a direct influence on the rest of the story and changes the end of the game. What makes this structure so special is that the choices made are radical: there is no going back in the story. The main advantage of this structure is the richness of the story offered to the player. The disadvantage of this structure, which stems from its radical nature, is its exponential nature: the further you progress in this type of scenario, the more the number of branches multiplies. This makes it very difficult to manage the endgame.

Gauntlet: unlike Time Cave, in this game structure there is only one path to a satisfying ending. The alternative forks that are offered will lead the player either to death, to a dead end, or to an anecdotal passage that will allow them to return to the previous fork. The main advantage of this structure is that it is easy to set up. Its major disadvantage is its pronounced linearity (which can be slightly mitigated by the few alternative branches).

Branch & bottlenecks: this structure offers an interesting alternative to the first two, giving the player a degree of freedom while retaining control of the story. This architecture offers real branches (which may extend over time), but these variations in the story always end up at the same point (or 'bottlenecks'). However, this doesn't mean that the choices made by the player can't have long-term consequences. Depending on the player's choices, and using variables, the game system can, for example, give access to certain branches but not to others, or personalise the dialogue. The advantage of this structure is twofold: it offers a sense of freedom to the player, while allowing content producers to keep production at a reasonable level of complexity.

Open map: the game structures presented above all have one thing in common: the choices and branches are organised in a temporal manner. In the case of the open map, the nodes of the structure are geographical branches. In other words, most of the choices you make are designed to move your character around the game world. This type of structure, in which the player can wander around indefinitely, is well suited to role-playing games (RPGs) or certain contemplative adventure games. Note that the temporal dimension is not totally absent from this type of structure: it can of course have dialogue and a narrative thread, even if this is not its primary characteristic. The main advantage of this structure is the freedom it gives the player. Its disadvantage: the complexity of setting it up and managing alternatives.

Quests: the quest-type structure has distinct narrative branches, which themselves include a number of interlocking branches. The interconnections between the nodes of a single branch are very numerous, while those between the different branches are less so. As the game progresses, the different narrative branches tend to come together to offer a more controlled conclusion. Here too, the structure is well suited to a geographical organisation of nodes. The advantage of the structure is that it gives the player a great deal of freedom by offering numerous interconnected narrative nodes, while forcing the story to progress towards a framed epilogue. The disadvantage is the complexity of scripting and implementation.

So, which play structure should be chosen? In the context of the INES project, the choice of a preferred play structure must take account of the project's educational, design and dissemination constraints.

Educational constraints:

- Awareness game;
- Immersiveness that encourages involvement;
- Dissemination of an underlying message.

Design constraints:

- Design using a game template system;
- By non-professional scriptwriters (participating classes).

Distribution constraints:

- Distribution in an uncontrolled context (desktop/laptop/mobile).

Given these constraints, we have opted for a game structure that encourages the design of a scenario that is sufficiently open and rich (to give the player a certain feeling of freedom and encourage their involvement) while controlling the complexity of production and the duration of the final result. In other words, a Branch & bottlenecks structure.

Dialogs as main game mechanics

When we took stock of adventure games with rich storytelling (Life is Strange, Road 96, etc.), we realised that we were witnessing a new way of looking at dialogue phases: dialogue is asserting itself as a game mechanic in its own right, an essential system of interactivity.

In these new productions, dialogue phases are of course used to enrich and advance the story, but they are also tending to replace other game mechanics. For example, collecting and using items no longer involves managing an inventory, but is done directly via dialogue sequences.

What's more, dialogue is often coupled with other mechanics, making it much more fun and attractive to use. For example, the introduction of quick time events in a dialogue phase (i.e. the introduction of a time limit for choosing between several options) makes the decision-making process exciting by adding tension.

Based on this observation - and still with the aim of simplifying the prototyping process for schools - we decided to use dialogues as the main game mechanics. We've enriched it with conditions (depending on the choices made by users) and simple or specific interactions such as Quick Time events.

Contribution of the Competition of Ideas

By: Frédéric Mignon, Thomas Henrion, Fabian Andry

As part of this project, pupils from the participating schools (Zarco - Portugal; Mircea - Romania; Salvemini - Italy) were to create game scenarios to take part in a competition of ideas. To make this possible, we needed to create prototyping material to enable the schools to work in groups to develop these scenarios.

Prototyping material

The aim was to create a prototyping tool that could be used by schools and which would enable classes to create their own Serious Game scenarios on the subject of NPS.

We therefore needed to offer schools a methodology and prototyping material that would fit in with the constraints of group work. And above all, a system that was as immediate and easy to use as possible.

Initially, we looked at digital solutions. An online template system that could be used in class to design a scenario. While it was technically possible to set up such a system, it soon became clear that the digital option was not the best one. In fact, it meant letting one person handle (encode) the template while the other participants gave him their inputs. As well as not being a very interesting group dynamic, this method suffered from another major drawback: given the material constraints (PC and projector to enable everyone to see clearly) this system could only be applied to large groups. It was impossible to put this system into practice with small groups of around ten students.

We therefore turned to a more interesting alternative: a physical device (paper maps), printable by teachers and usable in the classroom in large or small groups.

The aim was for the participants to be able to construct their scenario using the cards provided.

Using the cards, they could set the context of the story, describe situations, places, characters and mechanics. They could easily illustrate and describe the actions and intentions of the characters. And, of course, create dialogue between the characters.

But above all, they could create story twists by creating actions, conditions and choices.

All of which allowed them to create interactive stories in an enriching group dynamic.

The beauty of the process was that it was simple to set up and easy to learn. A quick start guide was also produced to help the teachers supervising the work groups.

Analysis of the scenarios produced

Four scenarios were produced by the schools. One by Zarco, one by Mircea Cristea and two by Salvemini.

Although fairly accomplished, the scenarios proposed were not directly usable. Despite this, each scenario contained some very interesting elements, with some redundancies from one story to the next:

Zarco:

A young girl courted for her money (toxic friends - peer pressure)

She is faced with drug-user debts

The young girl is learning about NPS

She's experiencing the honeymoon phase

After rehab, the young girl is returning as a teacher

Salvemini:

A young man is quitting studies

He suffers family clashes and loses friends

He has a toxic girlfriend

He steals money from his uncle to take drugs

He is under peer pressure

Mircea Cristea:

Festive event (nightclub)

He has toxic friends

Access to the substances is easy

He is under peer pressure

The story has a dramatic ending

None of the proposed stories was sufficiently developed, so it was difficult to choose one scenario over another. As it was, it was impossible to create a game based on the material proposed.

On the other hand, each story included several key elements on the basis of which it was possible to build a 'consolidated' scenario. With these guidelines in mind, we set about writing a new scenario, taking care to pay homage to the scenarios created by the schools.

Construction of the Game Scenario

By: Frédéric Mignon, Thomas Henrion, Fabian Andry

To build this new interactive visual novel scenario, we drew on the key elements of the stories proposed by the schools. To bring them to life, we started with the idea of following the experience of a young person who gradually falls into the trap of consuming NPS. But what's special about our approach is that we don't put the player directly in the shoes of this youngster, but rather in those of his sister, who watches - almost helplessly - as her brother sinks.

In terms of the story, we've been careful not to make any value judgements about NPS consumption. The moral questions arise mainly in relation to the decisions the player makes, which sometimes have consequences that seem more positive than negative.

Because the player will regularly have to make decisions that will affect the course of the story. But these are illusions of choice: all decisions lead to the same end...

Constraints

To effectively engage the player's attention and spread the awareness message, we have chosen to simplify the game structure by making it more linear.

There will be no dead-end: as we know that this type of game is not replayed, it is important not to make the player start again, as there is a high risk of giving up.

Pitch & key ideas

We discover a young girl, Ines, sitting at the kitchen table. She looks sad. We approach the table to discover a set of Polaroid photos in disarray, as well as a newspaper article torn into two parts. All of these elements are blurred except for part of the newspaper article, which pulses to invite the user to touch it. An animation gives access to the article. We learn that during the Deep Vibes music

festival, Anton, a young man of 20, had to be rushed to hospital after consuming a new type of legal high. He is in a coma and could suffer severe neurological consequences. Ines is desperate to find out how he got there. On the table, three Polaroids automatically come together and become sharp. The user clicks on them to plunge into Ines' memories...

The player then goes from memory to memory to discover how Anton, Ines' brother, came to consume NPS, up to this dramatic end.

Over the course of the adventure, Ines will come face to face with being courted for her money. She rubs shoulders with toxic friends who use NPS thinking they know everything about it. She'll see her brother give in to peer pressure and start using these new, easy-to-access legal highs. She will witness a family clash when he decides to drop out of school. She watches as her brother steals to pay off his consumer debt. She will see her brother sink into NPS use until things really go wrong at a music festival. In the end, her brother pulled through and decided to speak out in schools about the dangers of NPS. He now owes a debt to Ines, who will have paid a high price for her unconditional love for her brother...

Story structure

The story is structured around three parts, each of which is subdivided into three chapters. There are nine chapters in all. Each of the three parts begins in the kitchen of Ines's house.

Prologue: Ines cries for her brother in the kitchen. She remembers...

Part 1

The prey: toxic friends invite Ines and Anton to a spicy party.

Curiosity: Ines finds out about NPS.

The party: Ines witnesses her brother's first temptation.

Part 2

The clash: Anton argues with his mother and leaves home.

Money: Anton takes refuge with a drug-dealing friend and has to pay off his debts.

The Fall: Anton steals from his uncle to pay off his debts.

Part 3

Job offer: Anton is offered a job by his drug dealer friend.

Under pressure: Ines tries to save her brother from peer pressure at a music festival.

Twilight: Anton collapses and Ines returns home alone.

Epilogue: Anton pulls through but Ines has paid a high price...

To emphasise the awareness-raising aspect of this Serious Game, we insert an 'NPS fact' between each chapter: this is a short informative paragraph on NPS-related themes:

Consumer profile

New Psychoactive Substances (NPS)

Honeymoon
Relatives
Peer pressure
Financial constraints
Legality
Testing services
Medical consequences
Raising awareness

User Habits, Constraints and Diffusion

By: Frédéric Mignon, Thomas Henrion, Fabian Andry

When it came to distributing the game, we had to take into account the consumption habits of this type of video game production.

User consumption habits

We know that 'core target' users (teenagers and young adults) consume a lot of this type of content on their smartphones. As this is an awareness-raising Serious Game, we need to ensure that the game is immediately accessible.

Constraints

To encourage users to try their hand at adventure, there needs to be a minimum of barriers between them and the content. So no application that can be downloaded from a store (iOS or Android). We need a direct access application, hosted on a web server and compatible with as many devices as possible.

That's why we've opted for a full web application, developed with a 'home-made' game engine (HTML / Javascript). To guarantee compatibility with as many recent mobile devices as possible, we developed it in a 'mobile first' way.

Diffusion

The web application will be directly accessible via the browser of the device being used. It will be available on smartphones and tablets (iOS & Android), laptops and desktops (PC - Mac - Linux).

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Chapter V. Educational Experiment

Amélia Veiga, Fernando Remião

Introduction

The INES project deals with the rise in the use of new psychoactive substances (NPS) among young people, particularly those aged 15–16 years. NPS represent a rapidly growing category of synthetic chemicals that pose significant dangers to public health, particularly among young people. According to the European Drug Report (European Monitoring Centre for Drugs and Drug Addiction [EMCDDA], 2018), the emergence of NPS continues to challenge public health, necessitating urgent identification and response strategies. Approximately 5% of young Europeans aged 15–24 years have already experimented with at least one NPS (Flash Eurobarometer, 2011), and the European School Survey Project on Alcohol and Other Drugs Report (ESPAD (2015) highlights a worrying trend of increasing NPS use among students aged 15–16 years in 24 European countries. In some EU countries, research indicates that NPS use is notably higher among minors (Deutsche Gesellschaft für Suchtmedizin [DGS], 2012).

Since most new NPS users are school-aged, the educational environment plays a critical role in addressing this issue. Schools must not only serve as a place for knowledge dissemination but also as a platform for fostering student-centred approaches that empower students to critically engage with the challenges they face. By applying the concept of sociological imagination, educators can help students understand how their personal experiences with NPS are connected to broader social

patterns and pressures. This awareness enables students to see the influence of societal forces on their behaviour and encourages them to take active roles in shaping their futures.

The INES project's educational experiment is framed by student-centred approaches and the concept of sociological imagination. Student-centred approaches gained visibility in school education during the latter half of the 20th century, influenced by educational reforms and theoretical developments highlighting active learning and student engagement. Various educational reforms in the late 20th century advocated for more personalised and student-centred learning environments, emphasising critical thinking, problem-solving, and the ability to apply knowledge in real-world contexts. Globally, there has been a movement towards educational practices that encourage student agency and collaboration (Garret, 2008). These trends reflect a broader understanding of the skills needed for success in the 21st century and have contributed to the visibility and adoption of student-centred approaches (Scott, 2015). Therefore, student-centred teaching and learning (O'Neill & McMahon, 2005) can refer to student participation in the design of their academic path, active learning (e.g. Higgs & McCarthy, 2005), which involves students in their learning through more interactive and dynamic environments, or changes in power in the relationship between student and teacher (e.g. Stephenson & Troy, 2003). Consequently, didactic and pedagogical strategies focusing on student-centred learning emphasise the importance of tailoring teaching to meet individual student needs. These strategies aim to engage students actively, promote deeper understanding, and foster critical thinking skills. Consistent with this, research has identified aspects of the classroom environment (the quality of student-teacher relationships and instructional approaches) and the school environment (school size, safety, rules, and disciplinary practices) as important (Finn & Zimmer, 2012). The INES project examined the instructional strategies specifically designed to address students' needs concerning the NPS topic. This analysis explored factors highlighted by Finn and Zimmer (2012), including student-student interactions, that promote discussion and support the expression of students' perspectives (Guthrie & Wigfield, 2000; Johnson et al., 1985; Osterman, 2000; Ryan & Patrick, 2001; Wang & Holcombe, 2010). It will also focused on instructional methods that foster deep inquiry and metacognition, enabling students to gain meaningful insights beyond the classroom (Newmann, 1992).

Additionally, the analysis considered how situational interest – defined by Rotgans and Schmidt (2011) as the potential interest in the INES project topic – relates to academic achievements and active learning. Cognitive strategies, such as those used in reading (Guthrie & Davis, 2003), were also evaluated. In turn, the sociological imagination, a concept developed by C. Wright Mills (1959), is also a theoretical perspective that underlies didactic and pedagogical experiments that can be

useful in addressing issues aimed at preventing NPS use by encouraging educators and students to consider the broader social, cultural, and economic contexts that contribute to substance use.

The educational setting comprised three schools: Colegiul Tehnic Mircea Cristea (Romania), Escola Secundária João Gonçalves Zarco (Portugal), and ITCS Gaetano Salvemini (Italy). The Mircea Cristea Technical College promotes educational management orientated towards an active social partnership to implement regional and local development strategies. It has relevant experience in training specialists in mechanical, electronics-automation, construction, environment protection, and media production and in implementing projects or programs from non-reimbursable funds. It provides education to 1040 students at the following levels: primary school, secondary school, and post-secondary education; vocational school; and post-secondary vocational school. The many forms of education existing at this school reflect its capacity to adapt didactic-pedagogical strategies to the labour market in the Brasov area, as well as in the county, allowing the graduates to choose a suitable university or profession for their qualifications.

Escola Secundária João Gonçalves Zarco is one of the public secondary schools in Matosinhos, with 1200 students distributed from the seventh to twelfth grades (both traditional and technological/vocational studies). It provides night school education, including adult education, and offers classes at two prisons: EP Santa Cruz do Bispo for women and EP do Porto for men. The school is included in a favourable social context, where students are committed to improving their knowledge and eager to have new experiences. The teachers are also highly skilled and committed to their jobs, making it possible for them to participate in several projects throughout the school years.

The G. Salvemini Technical and Economic Institute (ITC) is characterised by a high level of complexity both for its large number of enrolled students (1430), teachers (154) and ATA staff (27) and for its vast planning capacity that places it, also through widespread network agreements, as a reference for training and education at locally. The technical education courses it offers are as follows: administration, finance, and marketing; international relations for marketing; company information systems; tourism; and the 'Sirio Project' evening course in administration, finance, and marketing. It is located within the territory of Casalecchio di Reno, which is the fourth industrial centre of the province and one of the most important commercial platforms of the Region E.R., with shopping centres, hypermarkets, and an extensive network of shops and services in the centre and neighbourhoods, with the industrial area of Via del Lavoro, the craft areas Faianello and Bastia. The ITCS G. Salvemini organises two-, three-, or four-week work-school internships for all students under the provisions of Law 107/2015. All students can access courses to obtain language certifications.

ITCS G. Salvemini offers projects for international students who are not fluent in Italian, including producing videos in their own language on curricular topics, L2 courses with language mediators, and peer tutoring.

Purpose

The INES project aimed to meet several key objectives: (i) to enhance the knowledge and shift the attitudes of both teachers and students about NPS, their global spread, and the associated problems; (ii) to move away from isolated, one-time training events in schools; and (iii) to actively involve teachers, students, and academic partners (e.g. staff and researchers) in creating and applying educational content and strategies to address NPS issues; (iv) to promote the educational value of the 'game' to support teaching-learning processes, guiding students and teachers in the co-design of 'game ideas' according to the game architectures designed during the project lifecycle. In order to achieve these goals, the project implemented a continuous, contextually relevant, and iterative approach to educational practices.

This approach was implemented based on collaborative co-design processes involving academic partners, game design experts, teachers, and students in developing effective 'learning paths' on the NPS topic, cross-sectional for all school disciplines. The teaching and learning setting in which the INES project was developed underscores how school innovation is a process that starts, as much as possible, from teachers' 'protagonism' and also encompasses the students. According to the OECD (Organisation for Economic Co-operation and Development) (2018) recommendations, teachers should be empowered to use their professional knowledge, skills, and expertise to deliver the curriculum effectively. As Sherry and Gibson (2002) stated, to make educational innovation sustainable, mutual resources and benefits must take on a movement that can continue across all parts of the system. Otherwise, a learning innovation can be limited to a small school area, not affecting most students. Consistent with this, the educational experiment involved active participation (based on the teachers' and students' voices), fostering agency and empowerment of teachers and students, and supporting innovation at the school system level, not only at the classroom level. The experimentation also included moments of interdisciplinary and multidisciplinary exchange and work among teachers and researchers in constructing open educational resources on NPS.

During the experimentation, the schools created and tested learning contents – released with open licences to facilitate adaptation and reuse by other teachers – and teaching strategies suitable to manage the issue of NPS use in an innovative and transversal way. An action-research approach was

developed to guarantee the sustainability of innovation processes within the participating schools. Its focus is enhancing teaching and learning and the conditions under which teachers and students work in schools. Action research is deemed to support teachers in coping with the challenges of carrying innovations reflectively while introducing NPS use. Action research supporting and fostering teacher agency begins with identifying teachers’ practices within pilot schools requiring to further development regarding NPS content and open educational resources (OERs). Then, based on the collected data (e.g. conversations with teachers and pupils and observation) and through analysis, teachers’ practices are clarified, and action strategies are developed to put them into practice. Their effects were monitored to learn from experience and improve action strategies. By making their professional knowledge accessible to others through oral presentations to other teachers or printed materials, their insights are opened up for critical discussion.

Based on this framework, the INES project started to create a European syllabus on the NPS topic for school education, incorporating the topics into the curriculum of each partner school. The curriculum should be designed around students to motivate them and recognise their prior knowledge, skills, attitudes, and values (OECD, 2018). In addition, the INES project designed a short-blended learning course on NPS addressed to teachers, students, and educators and available within the open-source INES online platform (based on Moodle), supporting the design and publication of OERs coproduced by teachers, academic partners (e.g. academic staff and researchers), and external experts (e.g. case reports, video interviews, multimedia presentations, proposals of didactic activities, and games).

Methodology

Participants

The educational experiment involved 179 students, including 141 girls (Table V.1.), aged 15–18 years, thus all in secondary education. The participants included 10 students with specific educational needs. Additionally, 17 female teachers aged 45–65 years participated in the experiment. Each of these teachers had prior experience in international projects, with their involvement ranging from 1 to 5 years.

Table V.1. INES Participants’ Demographics and Experience in the Educational Experiment

Category	Details
Total Students	179
Female Students	141

Age Range (Students)	15-18 years
Education Level (Students)	Secondary Education
Students with Specific Needs	10
Total Teachers	17
Female Teachers	17
Age Range (Teachers)	45-65 years
Teacher Experience in International Projects	1-5 years

Procedure

The INES project was a collaborative educational initiative focused on tackling the issue of NPS through innovative teaching and learning strategies in secondary education. It brought together three universities and three schools in Italy, Romania, and Portugal to develop and implement a comprehensive educational framework that engages both students and teachers in understanding and combating the risks associated with NPS. The following step-by-step overview outlines the key phases of the educational experiment, detailing how academic research, collaborative curriculum development, and teacher-led instructional design were integrated to create an educational toolkit supporting the educational experiment.

Step-by-step Overview of the INES Project's Educational Experiment

Collaboration with Universities and Schools:

- The INES project centred on collaborative efforts between universities and schools to develop didactic proposals and teaching-learning pathways focused on the issue of NPS.

Development of the Syllabus proposal and Short Blended Course:

- Academic partners began by developing a syllabus proposal on the NPS topic. This syllabus was then presented and shared with teachers from the partner schools.
- Following the syllabus's development, the project-initiated action research to co-construct an anonymous survey to identify students' and teachers' knowledge and any prior NPS-related experiences.
- Collaborative work among teachers, secondary school students, academics, and university students from the partner universities was encouraged to optimise the needs analysis phase. This approach strived to stimulate evidence-based NPS education.

- The involvement of university students, particularly those studying toxicology and medicine at the undergraduate and graduate levels, was deemed valuable for identifying educational needs.
- University students engaged with secondary students from the three schools to assess how they applied their knowledge of NPS, particularly focusing on their associated risks.
- This phase involved identifying secondary students' knowledge gaps and developing essential life skills through an anonymous survey, which was developed after peer-to-peer collaboration.
- The data collected through the survey was used to map the macro characteristics of the pilot schools (located in three different European countries) and to identify the training needs of both students and teachers.
- In the first year of the INES project, a short BLC (Blended Learning Course) was developed as a foundational resource.
- This BLC compiles essential scientific resources, carefully crafted and refined by researchers and academics specialising in NPS and the humanities.
- The BLC is structured into five multidisciplinary teaching modules, each containing three didactic units (one per school).

Teachers Creation of Didactic Units:

- After thoroughly reviewing the content of the BLC and the survey results, high school teachers were tasked with creating didactic units (micro-designs of learning content) for each segment of the teaching modules.
- A descriptive template was provided to guide the instructional design and content creation phases.
- The result was the development of 15 didactic units, all incorporated into a micro-Massive Open Online Course and featured in the INES Toolkit.

The INES project took a comprehensive approach to equipping teachers with the tools and knowledge needed to address NPS in their classrooms. This approach was based on collaborative research and evidence-based practices and involved a step-by-step account.

The educational experiment was conducted in two phases (Table V.2.). The first phase took place from 5 February 2022 to 31 May 2023, and the second phase took place from 12 January 2023 to 19 March 2024. Forty-five sessions were held Throughout the INES project, amounting to 66 hours of

instruction. The first phase consisted of 14 sessions, totalling 21 hours, while the second phase consisted of 31 sessions, totalling 45 hours.

Table V.2. Breakdown of the Sessions and Hours Across the Two Phases of the Educational Experiment.

Phase	Date Range	Number of Sessions	Total Hours
Phase 1	5 February 2022 to 31 May 2023	14	21
Phase 2	12 January 2023 to 19 March 2024	31	45
Total		45	66

The disciplines covered in both phases of the experiment included chemistry, biology, English, Portuguese, history, Italian literature, education, law, computer science, and counselling and guidance.

The materials and spaces used during the teaching-learning activities combined both virtual and in-person environments to support the didactic activities, as indicated below:

Virtual Spaces:

- Emails
- Google Classrooms
- Google Meets
- INES Moodle Platform

In-person (Physical) Spaces:

- NPS identity cards
- Classrooms
- Laptops
- Video projector, projection screen, laptop
- Meetings with students (assuming these are in-person)
- Auditorium

Active learning strategies engage students in learning through activities requiring active participation rather than passively receiving information. The active learning strategies implemented in the experiment phase included:

- Blended learning
- Brainstorming

Collaborative activities
Cooperative learning
Debate
Discovery (learning by)
Face-to-face collaborative work (five students per group)
Jigsaw (cooperative learning)
Kahoot
Learning through discovery
Learning videos
Mind maps
Problematisation
Project-based learning
Roleplays
Teamwork
Virtual translation – free discussions

These strategies involve interaction, problem-solving, critical thinking, and practical application of knowledge, which are central to active learning about NPS.

The **tools** from the list that support teaching and learning are:

Computers or tablets used for listening, watching videos/documentaries, and finding online scientific articles
Google apps
Group discussion
Interactive display board
Interactive whiteboard
Online presentation on the INES platform
Presentation and writing programmes
Projection screen
Video (projecting contents and contents created by students)
Video materials from the INES platform

These tools are often used to enhance the learning experience, facilitate content delivery, and support student engagement and interaction.

Data Collection

In order to collect data during the educational experiment, a survey was designed to capture how the activities were conducted in the classroom from the perspective of teachers ($n = 15$) and students ($n = 129$) covering all the didactic units implemented (see Step 3 of the INES Project's Educational Experiment).

Furthermore, a detailed form was designed to facilitate comprehensive data collection across multiple facets of the activity. The **teacher's activity report** ($n = 12$) captured information about participants' demographics, evidence, and impact assessments of the educational experiments. Each section of the **teacher's activity report** is described below.

Teacher and Student Profiles: The teacher's activity report documents the number of participants, demographics, and special needs, providing baseline data on the individuals involved. This information is important for understanding the feedback and outcomes reported later in the form (Table V.1.).

Timeline of the Activity: Recording the start and end dates, number of sessions, and total duration provides a detailed activity timeline, which helps in analysing how time management and session frequency may have impacted the effectiveness of the teaching strategies (Table V.2.).

Overall Appraisal: The sections on successes, difficulties, and overcoming constraints collect qualitative data on the experiential aspects of the activity. By recording what worked well and what did not, the teacher's activity report aids in understanding the practical challenges faced and the strategies used to address them.

Collected Evidence: This section of the teacher's activity report reminds participants to collect physical evidence such as photos, videos, and digital artefacts. These materials provide robust evidence that the activity was conducted and that students were involved. They also provide valuable information about the learning process and results.

Contributions to Student Learning: The teacher's activity report also includes a section evaluating the development of various competencies and skills. These quantitative data help assess the activity's effectiveness in fostering specific areas of student growth.

Contributions to Project Objectives: By evaluating how the activity contributes to the project's objectives, the teacher's activity report aligns teaching strategies with broader

goals, enabling evaluation of intended outcomes and providing feedback for future adjustments.

This systematic data collection supports detailed analysis and informed decision-making for refining teaching strategies and improving future educational outcomes.

Results and Analysis

The analysis utilised aggregated data from the participating schools as each implemented a didactic unit per module and disaggregated data from teachers' and students' responses. A qualitative analysis was conducted using thematic content analysis, focusing on teaching and learning approaches to enhance student engagement (e.g. student interactions, active learning about NPS, deep inquiry and metacognition, and cognitive strategies). Descriptive statistics were used to summarise the qualitative data.

This analysis started by identifying the engagement activities teachers outlined for each module and describing the activities they created. It then looked at how students perceived their engagement from the perspective of the teaching and learning approach and the sociological imagination concept. In its second part, this chapter examines the activities conducted by teachers from the three participating schools.

The engagement activities included group work in discussions, debates, and projects and emphasised collaborative learning, allowing students to share diverse viewpoints and deepen their understanding. These activities encouraged critical thinking about the societal implications of NPS use, such as analysing the global distribution of NPS and their varying regional impacts.

Student-centred learning was evident through collaborative discussions, creative expression, multimedia resources, and reflective exercises. These methods helped students connect personal experiences with broader societal issues, fostering a comprehensive understanding of NPS use and its consequences.

The activities were designed to engage students in active learning, exploring how societal factors influence NPS communication and diffusion. Using sociological imagination, students linked personal and societal values to the larger context of NPS, reflecting on the intersection of individual choices and societal influences.

The approaches promoted critical thinking, creative expression, and a nuanced understanding of NPS and their societal impact.

Analysis of teacher’s activity report from the three participating schools

Twelve teachers completed the **teacher activity report**. The sections on successes, difficulties, and overcoming constraints collect qualitative data on the experiential aspects of the activity. The teachers were asked to provide their perspectives about the aspects most appreciated, difficulties encountered, and strategies to overcome difficulties. Based on the information provided, the most appreciated aspects were:

Educational Value: The opportunity to learn new information about NPS and the INES project was valued highly. The participants found the project enlightening, informative, and important for both teachers and students.

Interaction and Engagement: The interaction with students and teachers from other schools and countries, as well as the debates and discussions about NPS, were particularly appreciated. This interaction provided a broader perspective and made the learning experience more engaging.

Practical Learning: Participants valued the practical aspects of the project, such as learning to identify reliable sources of information and understanding the risks associated with social media. The simplicity of the explanations and the use of videos to convey information were also viewed as positive aspects.

Frequency and Relevance: There was a strong sentiment that such projects should be more frequent in schools. The opportunity to address and reflect on important topics like NPS was considered reassuring and significant for both students and teachers.

The main constraints and difficulties encountered were:

Lack of Time: The most frequently mentioned constraint was a significant lack of time to perform the activities, which was highlighted multiple times as a major issue.

Insufficient Materials: There was a lack of materials needed to study the subject effectively, making it difficult to fully engage with the content.

Complex Information: The complexity of the information required additional study to understand and apply the teaching methods effectively.

Confusing Layout and Translation Issues: The website layout was initially confusing, and there were minor problems with translation that hindered the ease of use and comprehension.

Timing Conflicts: Reconciling the project's timing with the existing teaching schedules and disciplinary programs was challenging.

The main strategies identified by teachers to overcome difficulties included:

Leverage Student Involvement: Utilise students' enthusiasm and responsibility to enhance engagement and participation.

Teacher Investment: Teachers dedicated significant time and effort, recognising and committing to the project's importance.

Seek Additional Information: Search for supplementary information online and from project partners to fill knowledge gaps.

Adapt to Layout: Familiarise with and adjust to any confusing or challenging layouts over time.

Focus on Relevant Content: Choose targeted and shorter activities that align with the available time and resources.

Suggestions for future projects:

Improve Accessibility: Make terms more accessible and provide better training for teachers.

Streamline Materials: Refine and focus materials to ensure they are more targeted and manageable.

The combination of valuable content, engaging methods, and practical skills was most appreciated. The main constraints experienced were a significant lack of time for activities, insufficient study materials, complex information requiring extra effort, confusing site layout with translation issues, and difficulties aligning the project's timing with existing teaching schedules.

The analysis of the contributions of educational experiments to student learning showed their effectiveness in fostering specific competencies of students (Figure V.1.). The data showed a strong overall performance in the development of various competencies among students, with a few areas indicating room for improvement.

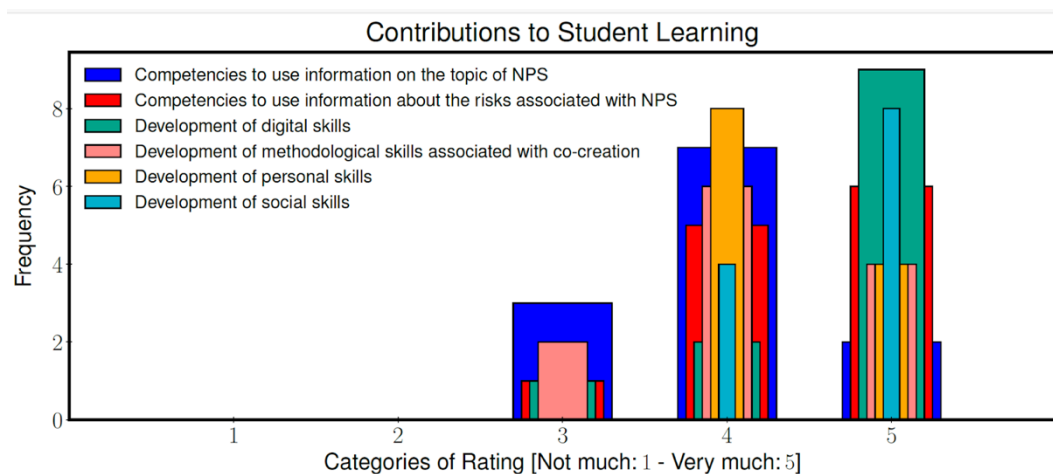


Figure V.1. How much do you think the activity contributed to your students' development of the following competency domains?

Competencies to Use Information on the Topic of NPS: Most scores were clustered around 4 and 5 (Likert scale 0-5), suggesting that most students developed a good to very good understanding of the topic. However, there are a few lower scores (3), indicating some variability in comprehension among students.

Competencies to Use Information About the Risks Associated With NPS: This area consistently scored high, with many students rating it as 5, indicating that the teaching strategies were particularly effective in conveying the risks associated with NPS, reflecting strong learning outcomes in this domain.

Development of Digital Skills: Most students rated this competency as 5, with only a few slightly lower scores (4 and 3), suggesting that the activity was very effective in enhancing digital skills, although there is a small subset of students who might have benefited from additional support or resources.

Development of Methodological Skills Associated With Co-creation: Students' scores ranged from 3 to 5, with a notable concentration around 4 and 5, suggesting that while most students felt they gained significant methodological skills, some did not find this aspect as impactful, possibly due to varying levels of engagement or prior experience.

Development of Personal Skills: Students' scores were mostly 4 and 5, indicating that they generally felt the activity contributed well to their personal growth. However, a few lower scores (3) suggest that this area could be further enhanced for some students.

Development of Social Skills: This category received high scores, with many students rating it as 5, implying that the activity was very effective in fostering social skills, likely due to the collaborative and interactive nature of the tasks involved.

The data reflects a strong positive impact of the didactic unit on student competencies, particularly in understanding the risks of NPS and developing digital and social skills. Areas with lower ratings indicate those where additional focus or alternative strategies might be needed to ensure all students benefit equally.

By assessing how well the activity contributed to the INES project’s objectives, the teachers provided valuable insights into how well the didactic unit achieved its objectives (Figure V.2.).

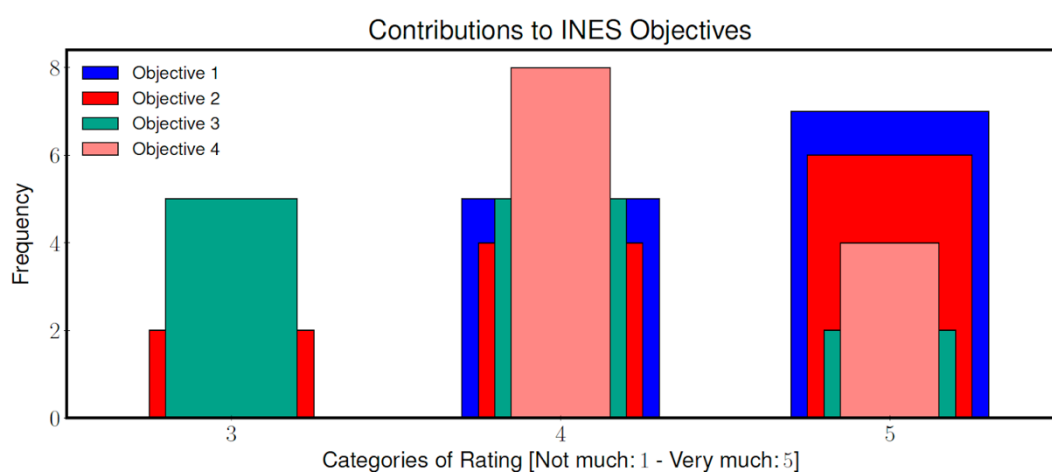


Figure V.2. How much do you think the activity contributed to progress towards the INES projects’ objectives?

Objective 1 (Increase the Knowledge and Adapt the Attitudes of Teachers and Students Regarding NPS): This objective consistently received high scores, with most ratings being 5, indicating that the activity was highly effective in enhancing knowledge and attitudes about NPS among participants, reflecting a strong educational impact in this area.

Objective 2 (Avoid School-Based Training Interventions Represented by One-Off Episodic Events): Like Objective 1, this objective also received predominantly high scores (mostly 5), suggesting that the activity successfully avoided being a one-off event. The structure and continuity of the intervention seemed to have been well-received and effective in ensuring sustained engagement.

Objective 3 (Involve Teachers, Students, and Academic Partners in Defining and Implementing the Content and Teaching Strategies to Address the Issue of NPS): This objective received mixed ratings, with scores mainly around 3 and 4, although a few were 5, indicating that while there was some involvement of various stakeholders, there may have been inconsistencies or room for improvement in fully engaging all parties in the development and implementation process.

Objective 4 (Promote the Educational Value of the ‘Game’ to Support Teaching-Learning Processes): This objective was mostly rated as 4 and 5, indicating that the game-based approach was generally well-regarded and perceived as valuable in supporting the learning process. However, the presence of a few 4s suggests that there is still potential for further enhancing the educational effectiveness of this approach.

These data suggest that the didactic units were particularly successful in increasing knowledge about NPS and avoiding episodic, one-off training interventions. While the involvement of stakeholders in content creation showed some variability, the use of games as an educational tool was largely effective, with room for further refinement to maximise its impact.

The educational experiment faced several limitations that impacted the results, primarily related to collecting and representing responses. One challenge was the decision to centralise feedback through one or two representatives per didactic unit. This approach limited the scope and diversity of teachers’ responses, as it did not capture the full range of perspectives from all participants within each unit. Additionally, the number of students participating in the survey on their engagement activities was unbalanced, with varying numbers of respondents across different schools. This disparity in participation complicated efforts to draw meaningful comparisons between schools. Therefore, the findings could not be effectively contextualised within the broader educational settings of each school. This lack of comprehensive data from a more diverse group of participants prevented a nuanced understanding of how engagement activities were perceived and implemented across different contexts. In order to address these issues in future experiments, it would be beneficial to collect responses from a broader and more representative sample of participants and ensure a more balanced distribution of feedback across all involved schools. This approach would provide a clearer and more contextualised view of the effectiveness and impact of the engagement strategies employed.

Conclusions

The key findings underscore the relevance of educational experimentation in addressing the effectiveness of didactic and pedagogical strategies in these aspects:

Continuous and Iterative Process: Unlike one-off interventions, educational experimentation emphasises a continuous process of testing, evaluation, and refinement. This iterative approach allowed teachers to adapt teaching methods based on ongoing feedback and outcomes, leading to more effective and sustainable educational practices.

Contextual Relevance: Educational experiments are designed to be contextually relevant, considering the specific needs, challenges, and dynamics of the educational environment. This approach ensures that interventions are not only theoretically sound but also practically applicable to the particular setting in which they are implemented.

Integration with Existing Practices: Rather than being isolated events, these experiments were integrated into regular educational practices and curricula. This integration helps create a seamless learning experience that reinforces and builds upon existing knowledge and skills.

Focus on Long-term Impact: Educational experimentation aims to achieve lasting improvements in teaching and learning outcomes. By moving away from episodic interventions, educators can focus on developing strategies that lead to sustained behavioural and cognitive changes among students.

Collaborative and Participatory Approach: Educational experiments often involve collaboration among educators, students, and other stakeholders, fostering a participatory approach to educational development. This collaboration ensures that multiple perspectives are considered, enhancing the relevance and effectiveness of the interventions.

The educational experimentation provided a framework for developing dynamic and responsive educational practices better suited to address the complexities of modern educational challenges, including preventing NPS use.

As the educational practices were based on the results of the educational experiment, recommendations addressing organisational, technical, and didactical aspects can be made.

Based on the described constraints, the evaluation of Objectives 3 and 4, and the strategies identified to address difficulties during the INES project, recommendations can be made at the organisational, technical, and didactical levels.

Organisational level:

Adjust Scheduling: Align project activities with existing teaching schedules to minimise conflicts. In order to better manage time, consider integrating project tasks into regular lesson plans or school activities.

Enhance Stakeholder Engagement: Develop structured plans to ensure consistent involvement of teachers, students, and academic partners throughout the project. Organise regular meetings and feedback sessions to facilitate their input and collaboration.

Support Teacher Commitment: Recognise and incentivise teacher involvement and dedication. Implement systems to provide support and acknowledge the additional effort teachers contribute.

Streamline Project Management: Simplify project management processes to better align with the available time and resources. Prioritise and focus activities to make them more manageable and effective.

Technical level:

Improve Resource Availability: Ensure all necessary materials are provided and easily accessible. Conduct a thorough inventory of required resources and secure them before the project begins.

Simplify Complexity: Break down complex information into more learnable parts. Use visual aids, summaries, and interactive elements to make the content more understandable.

Optimise the Game-Based Approach: Collect detailed feedback on the game-based approach to identify areas for improvement. Implement updates to enhance its educational value based on this feedback.

Enhance Accessibility: Improve the accessibility of all project-related resources. Ensure that materials, tools, and platforms are user-friendly and easily navigable. Provide clear instructions and support to help users adapt to any technical challenges.

Refine and Update Materials: Continuously review and update educational materials to ensure they are relevant and focused. Eliminate unnecessary content and streamline resources to make them more targeted and manageable.

Provide Comprehensive Training: Offer thorough training for teachers and students on effectively using project materials and tools. This training should address any issues with confusing layouts or technical difficulties.

Didactical Recommendations:

Provide Additional Training: Offer training sessions for teachers and students to better understand and apply the teaching methods. This training should address the complexities of the information and include practical examples.

Develop Support Materials: Create supplementary materials, such as guides to support both teachers and students. They should clarify the teaching methods and provide strategies for overcoming common difficulties.

Foster Continuous Feedback: Implement a system to collect regular feedback from both teachers and students to identify issues early and make timely adjustments to the teaching methods and materials.

Refine Educational Content: Continuously assess and refine the educational content delivered through the game. Ensure that it aligns with learning objectives and addresses any gaps identified in feedback.

Enhance Training and Support: Offer targeted training for teachers and students on effectively using the game in teaching and learning. Provide ongoing support to help teachers fully utilise the game's features and integrate it into their teaching strategies.

Encourage Ongoing Adaptation: Promote flexible teaching strategies to adapt to evolving needs and challenges. Encourage teachers to continuously adjust their approaches based on real-time feedback and experiences.

Seek and Integrate Feedback: Implement mechanisms for ongoing feedback from both teachers and students to identify areas for improvement. Use this feedback to refine educational practices and materials continually.

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Chapter VI. INES Teachers' and Students' Voices

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Stephen D. Brookfield's critical reflection concept, as presented in *Becoming a Critically Reflective Teacher* (2017), provides a framework for teachers seeking to enhance their teaching practices. Brookfield argues that critical reflection allows teachers to understand better how their assumptions, methods, and decisions impact the learning experiences of their students. Central to his approach is employing multiple "lenses" to critically analyze one's teaching. These lenses help educators uncover blind spots, challenge ingrained biases, and align their teaching with the needs and perspectives of their students.

Under the framework of INES project, teachers were asked to engage in this reflective process, using the proposed four key lenses: the autobiographical lens, the students' lens, the colleagues' lens, and the theoretical lens. The autobiographical lens encourages teachers to reflect on their own experiences, values, and teaching practices. The students' lens highlights the importance of seeking feedback and understanding the classroom experience from the learners' perspective. The colleagues' lens involves learning from the insights and observations of peers, while the theoretical lens encourages educators to draw on research, theory, and pedagogical literature to inform their practices. Together, these lenses provide a multidimensional view of teaching, enabling educators to identify growth opportunities and to make changes that improve learning outcomes.

ITCS Gaetano Salvemini, Italy

Lens 1: Autobiographical lens

First of all, it is necessary to underline the importance of an international project like INES project that allows students to develop key abilities, not only in terms of improving English language but especially of a general awareness of the topic.

However, it has not been easy to balance teaching commitments with the organization of this international project so careful management of time and resources was crucial for its success. Although this course of action we had set, we do not hide the considerable difficulties due to asynchrony that has often occurred between the time of the project and that of traditional teaching of curricular subjects in a school fortunately very rich in projects and extra-curricular activities.

One of the main points we based our work on was precisely the time management and we have drawn up a list of priorities.

In order to balance teaching duties with the active involvement in this project, firstly, we have listed all our professional obligations such as school meetings, grading for the end-of-period report cards and especially lesson planning. After this, we have identified time gaps and included the collaborative project's activities among the various didactic deadlines.

As mentioned before, another essential strategy was to give priority; in fact, as a teacher, it is important to distinguish activities that are time-sensitive and which can be planned more flexibly, using a specific personal calendar.

Another thing that was really helpful is the collaboration with colleagues; thanks to it, we were able to share the workload, taking advantage of the strengths and the field of expertise of each of us. The teachers of our school involved in the INES project are six and the disciplines they teach are the following: English, Mathematics, Physics, Chemistry, Information technology, Italian literature. This broad spectrum of knowledge in different fields allowed us to make many points of view and a lot of contributions from multiple subjects, all related to the purpose of the international project.

We organized regular meetings with colleagues during which we took stock of the work that has been done from time to time, by comparing the results obtained and getting better and better the way how to divide our tasks (theoretical explanations and classroom activities, research, communication with international partners). This continuous exchange of ideas, sharing of resources and discussion of progress has been really useful. In particular, students have benefited from this interdisciplinary collaboration, enriching their educational experience. Another effective approach to match students' teaching commitments with the activities scheduled by the international project is the integration of the latter into students' curriculum; in this way it was possible to align teaching goals with project ones, making the project a key element of teaching strategy instead of an extra task.

For instance, the english teacher has assessed the correct use of english language, the pronunciation and the lexical fluidity of an oral presentation on NPS' concept and implications; chemistry teacher has introduced the concept of NPS from a substances' chemical composition point of view and evaluated this aspect; information technology teacher has based part of regular lessons on NPS distribution channels (especially through the use of the web), incorporating the main topics of the project into the plan of study.

This method allowed not only to manage time effectively but also to encourage students to take an active role in the international project. Teachers have assigned students specific tasks and have given them precise responsibility (preparing presentations, conducting research or comparing with

their peers) in order to involve them and enhance students' learning experience. This kind of integration helped to promote collaboration and to develop critical thinking between students, maximizing educational impact.

A powerful tool that has constantly guaranteed the success of the activities as of today has been the use of technology. In fact, thanks to the many digital platforms, it was easier to communicate and collaborate; as teachers, we could organize online meetings that helped us to set deadlines, track progress constantly and share information with international partners. In this way, the project has been able to keep an international character even without the need of organizing continuous trips abroad and making the organization completely sustainable.

Balancing professional obligations as a high school teacher with the active engagement required by the project was a real challenge and we tried to overcome it not only using strategic time planning but especially thanks to the administrative support. In fact, the help from Unibo and our school administration was crucial for the full realization of the international project. The role of our administrators was particularly vital for the organization of transnational meetings. The constant communication with the project leader has ensured the priority role of the project, leading to adjustments in the agenda and providing all the necessary resources.

Another strong point in the organization was to adopt a clear and regular communication with all people involved in the project (international partners, colleagues, students,..); this has ensured not only an explicit division of roles and responsibilities but it especially conveyed a sense of teamwork and cooperation.

In order to effectively co-exist both commitments, we have set realistic goals that were achievable both through teaching regular activities and project ones; in this way, it was possible to avoid burnout and to manage stress.

We actually have broken down large tasks into smaller ones, distributing them evenly among the classes involved and every little success achieved has been recognized so as to enhance motivation. Finally, it was necessary to take regular moments of reflection in order to understand what was going right and what could be improved. As a teacher, we have thought about how to manage time and we asked for feedback from students and colleagues; according to us, flexibility and being open to change, to try new approaches is essential to reach an effective balance.

The final result you get by applying all these strategies is definitely to have a richer educational experience for students and also a teachers' professional growth. Therefore, by implementing an

effective time management strategy, collaborating with partners, using technology, integrating project activities into students' curriculum and involving them, but also following all the tips listed above, we teachers have successfully balanced our professional obligations with the organization and the management of an international project like INES.

Lens 2: Students' eyes

One of the main ways of students' involvement into learning activities of INES project was through participation in group work and research tasks. In fact, students stated that the activities more engaging for them were those more collaborative that allowed them to work together on the topic; in particular, the most interesting activities were the one proposed by teachers on module 4 (regarding NPS consumers) and the activity on the creation of the story for the game.

Through these activities, the subject of NPS has certainly become more accessible to students because they had the opportunity to discuss and share information about this topic. The theme of addictions is interesting because it is strongly linked, unfortunately, to the world of young people and, in particular, the theme of NPS is new and unknown. The project has allowed students to investigate the pharmacological aspects of the new substances and, above all, the effects no one talks about.

Moreover, students consider that knowledge and skills gained through INES project can be applied in real-life situations and that the strategies on which they worked can be useful for them in the future. In this regard, we can underline that the knowledge about NPS is useful to raise awareness not only on the specific topic but also on the broader theme of addiction. Another important competence they have learned is the organizational one; they could experience it during the Multiplier Event when students have ventured into the use of the English language in an international context and they have tried to interact with others, sharing all their knowledge about addictions. Therefore, scrolling through the different didactic units, students have improved their English during material translation, and this will be a good job for future tasks.

All the activities carried out during these years allowed students to learn to work in groups not only inside their classes but also in cross-sectional groups throughout the school.

INES project, in fact, empowered interaction between all students involved who developed the ability to work in groups from the beginning. Students appreciated mostly the opportunity to express their opinion during all the steps of the project. However, as regards some possible improvements, we can find a more accurate calibration of the topic and the insights with the age and previous

knowledge of students involved; another aspect students would have liked to deepen is that of listening to the real-life story of NPS consumers.

A desire of students is to keep the project international so that they have the chance to travel and interact with people from other countries, by comparing different points of view.

The main moments in which the students' involvement emerged were outside school hours, during cross-sectional groups of students from other classes who have voluntarily decided to participate. Certainly, it was not easy to coordinate students from different classes who had to work simultaneously on interconnected topics, also because the overall time of experimentation, production of materials and reflection on the project itself was perhaps too short.

However, students believed that focusing only on unit 4 was a strength since they were able to analyse all aspects related to consumers in detail.

At the beginning of the INES project, teachers introduced students to the topic of addictions and then they were divided into small groups and worked together to explore the different aspects linked to the topic and at the end they shared all their findings with each other. This approach allowed them not only to acquire knowledge but to really understand the complexity of addictions and the impact they have on people and society, by engaging in a collaborative learning process.

The benefits associated to this collaboration are the following: a greater awareness about the concept of addictions, explored from multiple perspectives; an improvement in the abilities to communicate and work together as a team, listening to others, combining our performances to reach mutual objectives and managing our tasks.

In addition, thanks to the INES project, students have developed critical thinking skills; in fact, they had to do complex research, to create connections between distinct concepts, to present the results they have found in a clear and engaging way.

Another significant element that led the project is the freedom of opinion guaranteed to students who were able to express themselves even on delicate issues such as NPS; they could listen to opinions and formulate anonymous questions on the topic which were subsequently addressed to our experts from University of Bologna.

Through the INES project, students grew not only from a didactic point of view but especially from a personal and social perspective: each task assigned to them has given a sense of responsibility so, as young individuals, students felt that it was their duty to do something to counter the phenomenon of NPS diffusion.

Moreover, the most beautiful feature of the project is that it didn't deal with the issue using a prohibitionist accent but relying on scientific and sociological points of view in order to investigate the effects and reasons related to the use of NPS.

Furthermore, the subject has been discussed from many perspectives and many aspects have been deepened; it was fundamental to have a 360-degree view of the topic.

It is a real-world problem and, starting from this strong motivation, students are convinced that their efforts will be useful to contribute to a positive change in their communities, raising awareness about the risks connected to NPS and trying to prevent the use of these harmful substances.

Through this experience, students learned the importance of empathy, cooperation and proactive involvement in addressing complicated social issues.

So we can conclude by saying that the INES project is a valid didactic proposal that can be suited to all secondary schools for the following reasons.

It is reliable: in fact, it was designed and experimented by real schools in three different European countries.

It is international: in this way students had the opportunity to listen to not only different but also similar points of view.

It is a rich resource in didactic terms: in fact, students were able to study the topic autonomously and teachers could select and integrate the activities according to the curriculum of the school and the characteristics of the classes involved.

It represents a didactic and innovative way of promoting health education: in fact, the topic of NPS is new and contemporary and it is implemented through a digital game.

Lens 3: Colleagues' experiences

Some phases of the project, in particular those of design and experimentation of the teaching units, have represented for each teacher moments of reflection on their teaching practices and have allowed to start a constant process of training and improvement. As educators, actively seeking feedback from colleagues is an essential part of professional growth and development. In order to gain insights into our teaching practices and areas for improvement in implementing didactic units, we engaged in a variety of strategies to gather feedback and reflect on the teaching process.

One of the ways in which we actively sought feedback from colleagues was through formal and informal discussions and observations. We had meetings, organized during the INES project, as

moments of discussion, but also, we would seek out our colleagues to discuss the specific aspects of teaching NPS in our classes.

In addition to formal and informal discussions, we also participated in a kind of peer observation during the implementation of the teaching units. We often worked in a group of two teachers in the same activity and in the same class. We observed and received feedback on our teaching practices. This was a valuable experience as it allowed us to see how different teachers approached the same topic as NPS and how each could incorporate some of the observed strategies into their teaching.

In addition, each teacher implicitly received feedback from colleagues when designing the activities of the teaching units: the specific contribution of each teacher has allowed everyone to expand the personal baggage of teaching strategies and to share methods and activities that can be used not only in the INES project.

Moreover, an essential aspect of the project was the collaboration between the reality of high schools and the university: this sharing of planning has allowed us teachers not only to deepen a theme like that of NPS, but also to share with the academic environment the didactic aspects of such a discussion. The comparison, therefore, has been activated on several levels in a process of collaborative understanding!

Overall, this continuous cycle of reflection, feedback and self-reflection has allowed each teacher involved in the project to continuously improve her/his teaching/learning practices.

To encourage the sharing of knowledge about NPS and to collectively improve teaching practices about new psychoactive substances, different collaborative strategies can be employed and specific interaction and sharing platforms used.

The exchange of knowledge and information on the topic can take place in asynchronous or synchronous mode.

To facilitate the exchange of collected materials and/ or products on the subject and then proceed to storage can be used simple tools such as online shared folders and documents to be written in sharing.

In this process of building shared knowledge and teaching practices, the dimension of discussion takes on even more importance through online platforms such as dedicated forums (Moodle), social media discussion groups and synchronous online meetings.

Moreover, the organization of workshops, webinars or conferences on the topic of new psychoactive substances represents a way of sharing knowledge and collaboration much more involving among all the actors of the project.

To encourage a more in-depth and critical discussion of the topic, study groups or round tables could be organized in which teachers and researchers could analyse specific cases through the lens of interdisciplinarity.

Specifically, the team of our school was formed by teachers of English, Italian literature, Chemistry, Physics, Mathematics and Information Technology: this plurality of disciplines and teachers allowed us to make many contributions and points of view in the process of teaching and learning.

We want to conclude by reporting directly the voices of some teachers who have experienced the wonderful interaction of the project:

«INES project deals with a very topical issue and it seems to be very relevant to the age group of high school pupils. A strength is the didactic activities that the students perform in small groups and that leads them to relate to each other with a clear organization of roles and functions. The project allows to implement and integrate both the deepening of the pathological aspects related to the abuse of NPS and that related to the chemistry of these substances to be declined depending on the school curriculum. Overall, I consider it a didactic proposal to be repeated!» (F. Mascaro, Chemistry teacher)

«Being a literature teacher in the team for INES project allowed me to invest in my subjects to share with my students the stories of artists "addicted" to psychoactive substances, to illustrate the reasons that induce a young person to such use, to historicize the cultural significance associated with it. This has led me and them to reflect on the motivations that lead to the use of NPS and the way in which they have known variations throughout history. It is my firm belief that knowledge translates into awareness and that awareness makes choices. This has been the pillar of my life... even professional and this I try to share with my students ... » (D. Gudenzoni, Italian literature teacher)

Lens 4: Theoretical lens

At the end of this project, we can answer the question: how does the concept of 'curriculum negotiation' contribute to further improving the quality of teaching?

It is necessary to remember that the concept of curriculum negotiation refers to «a deliberate process in which educators invite students to actively contribute to shape the 'regular'

syllabus/curriculum. The goal is to give students a real investment in both their learning journey and the outcomes». (cfr. Boomer, 1992)

The involvement of students was initially a mass involvement and also strongly guided. The large number of students involved and the initial training activities defined and guided, such as the short online blending course on NPS, have allowed a clear and standardized path for teachers and students, but it was less personalized for students, who participated, but without an emotional involvement in the process of learning.

The real participation of students was ignited in the ideation of the story of the game; they found an active involvement in all activities related to this phase.

At this point in the project, we have left students the freedom to choose voluntarily to collaborate by being part of a pilot team.

The work of construction of the story for the digital game represents the culmination of the project in educational terms, for the purpose of a greater understanding of the subject of NPS, both in terms of the pleasure of a creative activity. The students put into practice real actions of research of the information necessary to build truthful and compelling stories and have, perhaps, better understood the various aspects of the topic of NPS, because they have identified themselves in the characters of the stories! At the same time this activity was carried out without constraints of school hours and this allowed us to meet after a good breakfast to work together in tune and by choice to do something extremely creative!

The students of the pilot team have shown interest in expressing their opinions on the educational aspects of the project, underlining the strengths and weaknesses of the INES project. They felt more involved in the moment of organization of Multiplier events both to the request to implement and improve teaching activities.

The syllabus/ curriculum underwent some changes in order to incorporate the activities related to the INES project in the school curriculum and cater to the interests of the students in regard to these activities. These changes were necessary also in order to combine the INES activities with the didactic ones of the classes during the different parts of the scholastic year.

One of the key modifications made to the syllabus was the simplification of some contents in the specific modules on the topic of NPS: the Educational cuts and the choice to discuss only some aspects of the main topic were designed to provide students with the necessary knowledge and skills

to actively participate in INES activities and benefit from the project outcomes. Additionally, teachers chose aspects in a way based on the interests and preferences of the students.

Moreover, by allowing students to have a say in their educational experience, we were able to create a more engaging and meaningful learning environment.

An example of changing the curriculum/ choosing contents was during the organization of the Multiplier event at Casalecchio di Reno: the students wanted a more real and daily approach to the topic, so we chose to include in the international event a moment of life story by a consumer of NPS who told about drug addiction and a moment of discussion with the local police about the abuse of new substances and their detection.

Overall, the changes made to the syllabus/curriculum in order to accommodate INES project activities and students' interests were successful in creating a more dynamic and student-centred learning environment. By actively involving students in the project and tailoring the educational program to their needs, the project was able to foster a sense of ownership and enthusiasm among students towards the INES activities.

Equity between teachers and students within decision-making processes regarding the inclusion of INES activities in the curriculum has seen significant evolution over the years. At the beginning of the project, teachers held the primary decision-making power with limited input from students. However, as educational philosophies shifted towards a more student-centred approach, the balance of power began to shift.

After the introduction of the project and the beginning of the blended learning course it was necessary to enable greater collaboration, sharing decision-making between teachers and students. This has led to a more equitable distribution of power, with both parties having a voice in the integration of INES activities into the syllabus.

Additionally, the use of informal surveys, focus groups, and feedback mechanisms allowed for ongoing communication between teachers and students regarding the curriculum. This open dialogue fosters a sense of trust and partnership, ensuring that decisions are made collaboratively and in the best interests of all stakeholders.

Students and teachers have worked alongside each other in a productive and effective confrontation to understanding!

The INES activities allowed to foresee the application of the project and the dissemination of the acquired knowledge beyond the school context.

The new theme and close to the youth world of our students, the multidisciplinary approach, the international dimension of an Erasmus project, the collaborative methodologies that have characterized all phases of the project have allowed to go beyond the didactic and classroom character of the project activities and have encouraged the development of transversal skills to address challenges and problems of the real world beyond outside the school environment.

These skills include collaboration, creativity, problem-solving, and the ability to think critically.

Moreover, as already pointed out, the INES project involved partners at European level, allowing students to interact with the outside world and to apply the acquired knowledge in real and authentic contexts.

Finally, INES activities promote inclusion and openness to the local community, also indirectly involving parents, families and other community members in a single large health education project.

Involvement with students, researchers, and academics from university contexts has been instrumental in providing a broader perspective about NPS for a variety of reasons.

Firstly, these individuals often bring fresh ideas, innovative research methods, and different viewpoints to the table, which can help shed new light on the issue of NPS and offer new solutions to the challenges associated with it.

Additionally, university researchers and academics are often at the forefront of research and innovation, meaning they are well-versed in the latest trends and developments in the field of NPS. By collaborating with them, we can stay updated on the most current research findings, emerging substances, and changing patterns of NPS use, allowing us to adapt our strategies and interventions accordingly. Researchers and academics from varied disciplines and backgrounds can provide a more holistic understanding of NPS, as they bring expertise from fields such as pharmacology, public health and education.

This interdisciplinary approach can help us explore NPS from multiple perspectives and address the complex and multifaceted nature of the phenomenon.

Overall, the involvement of university stakeholders in the study and prevention of NPS has enriched our understanding of the issue, broadened our perspective, and ultimately helped us develop more comprehensive and effective strategies to tackle the challenges posed by these substances. By fostering collaboration and exchange with university, we can continue to enhance our knowledge and response to NPS in a dynamic and evolving landscape.

João Gonçalves Zarco Secondary School, Portugal

Introduction

Coordinating INES ERASMUS+ Project was not an easy task, but feasible.

When there is a will, there is a way!

Zarco got the invitation from Porto University. We felt honoured and acknowledged the responsibility.

Zarco is a school of challenges. And INES ERASMUS+ was going to be one more.

So, meeting after meeting, we started to see what was coming.

We are talking about a partnership involving three European Universities, three Secondary European Schools and one European Apps Development Studio.

Adding to this diversity, we had to deal with the topic NPS – New Psychoactive Substances. A sensitive matter. The teachers didn't have the clues of what NPS were. Neither the students after a first approach. So, we realised it was something we really had to do.

The plan was to work with three Working Packages for three years and from five Modules we had to select one Didactic Unit from each one.

Different meetings were held online with the partners and at Zarco with the teachers and students.

The work started to flow nicely

In the end, we can say that the teachers' and students' work surpassed all our expectations. All the goals were achieved.

In spite of the bumpy roads we faced, we made it!

As William Shakespeare once said: "It is not in the stars to hold our destiny, but in ourselves"

Zarco INES Team Coordinator,

Manuela Galante

Teachers' insight

Olivia Rodrigues, Physics and Chemistry Teacher

Lack of time was a constant issue throughout the INES Project. Nevertheless, due to a good time planning, I managed to complete the planned project activities, and the ones related to our curriculum sacrificing, sometimes, my personal time. The beginning was harder, and it took me some more time to make the right connection among the project topic, its activities and the students' learning demands. As soon as I put INES topic into context and started motivating the students, my professional time duties and the INES Project activities got into the right path and became much

more balanced. My further knowledge on the topic NPS also made me feel more secure to handle it with students. Initially the students' expectations were focused on their knowledge acquisition about NPS and the Didactic Units selected – for most of them this was completely new. After creating the enlarged students' groups, with students from the Secondary level with different ages and planning meetings after the school timetable, our common work started getting into shape. It allowed the presence of all students involved and their commitment to the planned activities conclusion. Sub-topics were selected, tasks were set and the work started to show up. THE communication channels used were very effective. My job was to work DU1 Synthetic Cathinones from Module 2 with the group of students who had chosen this DU. Being a Physics and Chemistry Teacher we started by understanding the chemical formulas of the organic components, giving emphasis to the functional groups and to the importance of some of those components in our body. Then, some cathinones formulas were shown, similar to organic components and their dangerous effects were debated and registered. After these references, the students were asked to analyse some open questions on the matter (created in advance so that previous knowledge could be given to students) and then answer them. With their answers they would create a Mentimetre Cloud for further analysis and written conclusion. These texts were shared in the INES Google Classroom in order to be shared with the other students' groups. Throughout this activity the students developed their knowledge on the matter, their creative thinking, their interaction/cooperation among peers, their resilience, their autonomy and their digital skills. The upcoming tasks like research, selection, collection, information organization and materials production allowed them to strengthen, enlarge and share all the acquired knowledge about the negative and toxic effects of NPS, enhancing as well the "ignorance factor" on this updated matter. This perspective is very important for their personal and responsible decision-making towards NPS. Zarco INES Team teachers come from different school subjects (Physics and Chemistry, Portuguese and English) which allowed different approaches to the attended matters. Each Didactic Units tasks, like planning, execution and evaluation were set up in common agreement among the partnership. Communication, opinion exchanges and suggestions were very effective and therefore adapted to each group of students. All the dynamics found and applied were a result of collaborative work keeping always in mind the students' learning and motivation. The use of Google Classroom and Moodle were very useful to promote debates and collect and share all the important data.

Teaching quality comes not only from the knowledge transmitted but also from the soft skills acquired. These soft skills acquired throughout INES project are in line to the ones expected at the end of the students' compulsory education. When they started out working in this project, the first

activity planned was the knowledge acquisition on NPS. At the same time, they had the chance to talk, ask questions, exchange impressions and manage their time while they were going through a process of acquisition, reflexion and communication on the NPS matters. During the upcoming activities, the work-line of work, the groupwork and the final gathering of each group contributions was negotiated based on the sub-topic chosen, the group availability, the requested time for the task conclusion and the final product to be shared. THE decision-making, involvement, cooperation, communication, resilience and responsibility were the keywords. Our students' final products are a sample of this. All INES activities were concluded successfully, and the students appreciated these results very much. INES Project shows us that NPS is a real problem, and the students looked for the solutions. THE teachers, as learning guides, had also to look for more information on the NPS matters, helping out the students on their path.

Isabel Fernandes, Physics and Chemistry Teacher

My biggest constraint throughout INES implementation was the ability to manage the project activities` time with my professional and personal time. It was very difficult to find balance in between. All Zarco students enrolled in INES were very much involved and committed and that is why we have such good final products. They were the true mentors in all activities proposed and final materials achieved. They overcame, in a large scale, the goals set and acquired an outstanding knowledge on NPS which surpassed all expectations. Now, at this final project stage, I would like to share the fact that by increasing the students` motivation towards what they learned, once they were the curriculum creators and the main actors, we were able to promote responsibility, cooperation and had the possibility to “test” new methodologies.

Manuela Galante, English Teacher

The Innovative teaching and learning paths for the prevention of new drugs abuse (INES) project aimed to create the conditions to support the collaborative networking of teachers, external experts, and students to find, test, adapt and use (within common teaching workflows) didactic strategies and resources to tackle the NPS problem. There were five Didactic Units distributed by five working groups – Teachers and Students. Time lacked; the work was immense but nothing that a good plan could not prevent things from happening. As Zarco coordinator I held the biggest responsibility of making everything work. Tiring but rewarding. My fellow teachers, my dearest students and all the partners were outstanding in their support and willingness. I have learned so much throughout this fantastic project. Not only as a teacher. Now I am much more prepared to

enlighten, advise and guide youngsters over this topic. The scientific input given by the partner universities through the INES Moodle Platform made it much easier to understand NPS and start the common work. Zarco participating students were outstanding in their successful efforts to overcome difficulties and accomplish what had been settled by the partnership. Their enthusiasm balanced with responsibility, hard and soft skills encouraged all the group to move forward. THE parents totally recognised the importance of such a topic to be addressed at schools. The fact that we had the universities to back us up with scientific knowledge made it trustworthy. All the teachers involved learned a great deal about NPS along with many digital skills that were taught by the students. There certainly was a two-way relationship where students and teachers mingled healthily in order to achieve the common goal. Quite an experience! I know there is still a lot to do. We are just a small part of the ones “who know more about NPS”. Therefore, we have to continue and spread the word. That is our future commitment.

Ana Moura, Portuguese Teacher

Bringing together school activities (classes, class leadership and carrying out other roles) with the INES project was challenging, as the functions at school are very demanding and increasingly time consuming. Therefore, I was always working in an attempt to maintain a constant balance not to fail, to be able to complete the tasks on time and to have the energy to motivate the students in the tasks to be carried out. My long teaching experience and the interest of the participating students greatly helped the rapid and efficient development of the activities. The module I was responsible for intended to identify reliable sources of information on NPS, so students should be able to distinguish between reliable and unreliable sources of information related to New Psychoactive Substances. This involves understanding the credibility of various platforms, such as scientific journals, government websites, and reputable health organizations, to ensure accurate and trustworthy information. As these essential learnings are also studied in my subject - Portuguese - it became very clear for the students to transport the contents of the subject to the work we were developing in the INES Project. Then, students had to evaluate information accuracy, so they have developed critical thinking skills to assess the accuracy of information on NPS. This included analysing the validity of data, examining the qualifications of authors, and considering potential biases. Students were capable of independently evaluate the reliability of information on NPS from diverse sources. In the next step, students were asked to apply research skills, so they acquired practical skills for conducting research on New Psychoactive Substances. This involved using different search engines, databases, and library resources to find relevant and reliable information.

Students had to be proficient in conducting effective research to conclude on information, risks and potential dangers on using NPS. Lastly, students presented their conclusions to the class. First, they concluded about which sources are reliable (e.g. provided by governmental agencies, scientific journals, non-profit organizations, academic institutions) and how they had evaluated the accuracy of the information. Then, students shared their conclusions with the class by an oral presentation, using supports as “Canva” slides and a mind map. They have also identified the risks of believing in incorrect information and made a list of potential dangers on using NPS. All the activities developed in the INES project were shared by the teacher’s group, so we were constantly giving and receiving tips to improve teaching practices, but mainly by observing the colleagues practices on how to lead the class to our goals. The self and group reflection after each activity was crucial to improve the process and to be aware of the learning outcomes and competencies that students made. In the rapidly evolving landscape of the 21st century, education must go beyond traditional teaching methods to prepare students for the complexities of the modern world. Secondary education plays a crucial role in equipping students with the necessary skills to thrive in an increasingly interconnected and technology-driven society. In the INES project we have intentionally used activities to achieve some of the key 21st-century skills, such as: Critical thinking and problem-solving that enable students to analyse complex issues, as NPS, make informed decisions, and devise innovative solutions; Teamwork skills help students work effectively with others, respect diverse perspectives, and achieve common goals. We know that collaboration is essential in almost every professional field, and we want our students to be able to thrive in this uncertain world; Effective communication skills are vital for expressing ideas clearly, listening actively, and engaging in meaningful dialogue. To achieve this skill, we have used strategies as oral presentations on NPS to improve public speaking skills and confidence; Proficiency with digital tools and an understanding of digital environments are essential in the modern workforce. Online research activities teach students how to conduct effective online research, evaluate sources, and use digital libraries. By integrating these strategies into the secondary education curriculum, we, as educators, can help students develop the essential skills needed to navigate the challenges and opportunities of the 21st century. Emphasizing critical thinking, collaboration, communication, digital literacy, creativity, global awareness, and self-direction will prepare students not only for academic success but also for meaningful and impactful lives.

Ana Fernandes, Portuguese Teacher

INES Project turned out to be a big challenge for me as an adult and a teacher who deals, on a daily basis, with teenagers who get appealing offers of substances that promise them “well-being” and “joy”. I knew nothing about the new Psycho-active substances. I was not at all familiar with them. So, it was quite an experience to get to know more about this dark world disguised as “well-being”. In the beginning it was pretty hard facing such a harsh and harmful reality that our youngsters have to deal with – they may be caught up in a deadly and evil web. That is disturbing! Nevertheless, it was my quest to send our students and their families a warning sign about the deadly effects of NPS. It was not an easy job considering how delicate the matter is and many times families seem to ignore it. But INES ZARCO Team of teachers along with Universidade do Porto Academics managed to involve all the school community and create a group of students who worked amazingly and totally aware of the matter. Their work started with the situation analysis, learning about it and disseminating their conclusions on NPS not only at Zarco and among the partnership but also among other schools in Matosinhos and Porto. As a Teacher of Portuguese my contribution dealt mainly with the student’s guidance on the information research and the oral presentations. To what concerns the collaborative work among our INES ZARCO Team, I think that we were able to share our ideas and knowledge that contributed to the soft skills our students developed: leadership, autonomy, critical thinking, critical intervention, innovation and creativity. Our student’s participation in the International Meetings sustained the commitment, the responsibility, the autonomy and the assertiveness that allowed their work to be appreciated and valued by the different institutional agents who participated in those meetings. In a constant changing world, it is very important that these Projects take place at schools so that our youngsters get to know the different realities. Even if they feel they are far away from them. We can, this way, improve their well-being. By working in international projects like INES, we reflect together, find differences and similarities, create good synergies and develop a spirit of solidarity, sharing and trust into the making of a more humanized and prosperous future.

Students’ insight

https://youtu.be/evrK5_1xhNA?si=vk1x0uLN3ZW7ZqC5

We started out with around 80 students from the Secondary level in 2019. THE work went well and according to plan. This group of students volunteered to participate and so they came from different classes and different levels. They all had in common the will to know more about NPS and work at European level. Their willingness, sense of commitment and good vibes were really contagious and

outstanding. They just wanted to know when and where were the meetings taking place, what they had to do and what was the deadline. They never failed on the group. Their sense of leadership, autonomy, responsibility and creativity have been proven and their final products` quality is the true example of what was said before. But it is also very important to listen to them and register their opinions. Here are some of their testimonies:

“I consider INES a good project, especially for our generation. At our age we tend to consider that these situations cannot change radically our lives and it is very reassuring that my school worries and takes us to think and reflect over this topic.”

Margarida, 11th Form

“I didn’t have the slightest idea of what we were going to be addressing neither of the importance of INES project. I knew nothing about the topic and was very willing to learn because I believe it is important.”

Carlota, 11th Form

“I think that these projects are very important for us. This kind of projects should be more frequent at schools. It is pretty beneficial to be here and make part of this project. At the same time, it is quite interesting and important to get in touch with the students and teachers from the other schools and countries. We will get to know other perspectives.”

Laura, 11th Form

“I think this is a good way for us to participate and bring together the school community, not only in Portugal but also at an international level complying with the Erasmus + goals. We have grown as human beings.”

Inês, 10th Form

“I enjoyed very much participating at INES Project because I was able to learn new things about NPS and I loved the work in group.”

Eduardo, 12th Form

“I believe that the meaning of life is to make sense to other lives. The stronger our intentions are, the bigger will our victories become.”

Leonor, 11th Form

“It was very pleasant and rewarding working in INES Project. We all came from different classes and it seemed we had known each other for ages. All the work went on smoothly.”

João, 12th Form

“Working in INES was very challenging. First we thought we would never make it, because we knew nothing about it. But, then scientific information started setting in and made us understand how important it is to inform young people about the dangers of these things. Looking back I can say that it was worth it. Loved it!”

Maria, 12th Form

“I am very shy and so I thought I would never participate in this kind of projects – especially european. The teachers challenged me and I said to myself - why not? And here I am now giving you my testimony. I do not regret any minute of it. The soft skills I thought I hadn’t, the new people I met and the amount of information I have now on NPS were outstanding feats for me.”

Mafalda, 12th Form

“I especially loved sharing our results with other secondary schools from Matosinhos and Porto. We had big audiences and they were all eager to listen to us and then debate NPS. We all learned a lot from INES Project.”

Edgar, 11th Form

Conclusion

On behalf of the ZARCO INES Team (figure VI.1.), I can only say that the following words fully represent what this Project meant to us:

Friendship Connection Opportunity Cooperation Equality Challenge
Determination Success Happiness Knowledge Hope



Figure VI.1. The Zarco team

Mircea Cristea Technical College, Romania

Lens 1: Autobiographical lens

Since it is an important international project for our school, we have tried to involve both the teachers and the students in the implementation of the project, making it one of our priorities. It was pretty difficult to balance professional obligations and active engagement in collaborative learning activities within the INES project, despite constraints like workload and other commitments. We used a series of strategies in order to make it easier to manage the activities in the project.

Firstly, we identified and focused on the most important tasks both at school and within the INES project. We established the priorities and the deadlines to ensure that important responsibilities were not neglected, and we stayed focused and motivated, especially because there were different school activities that had to be taken into consideration. It was crucial to allocate specific time blocks for professional duties and collaborative learning activities so we could track our progress and stay on schedule. Following the online meetings, we established meetings for the members of the team and used calendars in order to keep track of the commitments. It is very important to take care of the activities that are time-sensitive first, and then to take into consideration the tasks that are time-flexible. Recognizing the most important and urgent tasks in both our professional work and the INES project allowed us to focus our energy on high-impact activities. We had to set realistic goals for both teaching activities and project tasks and to break large tasks into smaller ones in order to avoid stressful situations. We have tried to review our plan regularly which has allowed us to adjust as needed and to stay organized and focused.

Secondly, we had to set boundaries between work hours and the time dedicated to the INES project in order to maintain focus on each task. This is something that the members of the team discussed among each other to avoid unnecessary disruptions, especially since it was a topic that involved a different topic that we were used to talking about. Even though the topic is highly debated nowadays, we did not know that much, which determined us to look for information and study more. So, in addition to our professional obligations that have involved hours of teaching-evaluation-learning, we had to study about the consumption of psychoactive substances, about the risks that their consumption attracts, but also about the short and long-term social implications.

One of the most important things was the contribution of the team members (teachers from different areas: Romanian and English language, Romanian and French language, Religion, Physics, Technical subjects, Informatics) both at work and within the INES project. It was pretty difficult for

some of us because of the use of another language, which was not Romanian, especially when we had to study the concepts related to NPS. But we asked for help when it was needed, and we have shared information and workload. Most of all, we have shared our point of views and resources, we have discussed the progress, we have compared the results, and this has been very useful both for us, but also for the students involved in the project. Maintaining open lines of communication with the members of the team allowed us to have better coordination, efficient problem-solving and mutual support.

We all studied the theoretical concepts, exchanged ideas and established what we had to do in the project. Each form teacher talked to her class about the concepts, about the education on NPS and about the involvement in the project. Then, we concentrated on a smaller piece for each class in order to prepare the didactic units. Little by little, the students have become more and more interested in the subject and in the project. They learned theoretical concepts, started to talk about NPS and have become more aware about the risks of consuming NPS. Our Informatics teachers helped the students to get the information and to answer the questions by using the computers in the lab. The form teachers talked to the students about the subject during the counselling classes and helped them with the materials they created. The language teachers checked the materials they had created and gave them feedback. And we have tried to talk to the students from different points of view in order to make them aware of the consequences of NPS use. These activities have encouraged students to take an active role in the project, because they had specific tasks in the project. Having to cope with different tasks allowed them to collaborate, to share information, to develop critical thinking, which helped the learning process.

We should mention that there has been a real interest from the University of Transylvania, through its representative, Mrs. Dana Perniu, who gave us explanations related to the questionnaire for the teachers and the students, but she also offered us precious information about the project. It was very important to communicate with the other representatives of the universities involved in the project in order to learn how to solve the tasks and how to implement the project. The school management helped us to share the information with our own colleagues, but also with the teachers from other schools, by making possible the organization of the Multiplier Event.

It would have been more difficult if we had not used the technology in our work. We have used different platforms to find the information and to communicate among us, but also to share documents and opinions. This has facilitated efficient collaboration and has reduced the time spent on coordination. It has made our life easier to communicate with our international partners and

with the project manager (who has constantly kept us informed) through online meetings, who guided us the whole time with the information and the tasks, which sometimes seemed rather difficult. This has helped to adapt to the necessities of the project but also to learn to explain to each other the tasks.

Another important thing is the possibility that we have had to reflect upon our work in the project as we had to create the didactic units and to revise them in order to respond to the project requirements. We have tried to adapt our strategies to the project and to adjust our work when necessary. We have also tried to think about the good points and the weak points of our work in order to improve it. The reflective process of creating and revising didactic units has enhanced our skills in instructional design, critical thinking, and problem-solving, which are valuable in both professional and collaborative learning contexts.

It was quite difficult to balance the schoolwork, as a high school teacher involved in the learning process, but also in the exams, with the duties from the project and we have tried to overcome it, even if sometimes the project deadlines coincided with the dates of some exams or with some school holidays, or even a teachers' strike.

By trying to implement a combination of strategic planning, effective time management, prioritization, collaboration, technology utilization, reflective practice, and adaptability, we hope we have succeeded to maintain a sort of balance. Taking into consideration all the above, this project brought us an important educational experience for the students involved in the project, but also a professional development for the teachers in our school, despite all the existing constraints, such as workload and other commitments.

Lens 2: Students' eyes

In the context of the INES project, students engaged in collaborative learning activities aimed at learning about NPS and the risks of consuming NPS. For them, it was important to take part in structured activities, in project-based learning, develop reflective practice and have continuous feedback. The project carried out by our school involved 5 classes, of which 4 from the eleventh grade and 1 from the twelfth grade, who had the opportunity to learn about the topic, especially the theoretical part, to discuss and to share information. They were involved in the study of specific substances, chemical properties, effects on the human body, legal status, and societal impact.

What is crucial is that the students worked in groups to complete projects related to NPS, which required regular collaboration, discussion, and division of tasks, ensuring that each member was

actively involved. Those made them feel that their opinion mattered. They used the INES platform to inform themselves about the topic, to ask questions in order to have a better understanding of the phenomena and to get involved in the project and in the group discussions and to create the materials for the didactic units (presentations, poems, songs, comic) and the group discussions provided opportunities for real-time interaction, collaborative problem-solving, and deeper engagement with the subject matter. When creating these materials, especially the comics, they simulated real-world situations involving NPS, in order to show the impact of such substances on other people. These simulations helped students apply theoretical knowledge to practical problems, enhancing their problem-solving skills and engagement. Some of them studied the impact of the consumption of NPS in films and TV series, identifying key issues, and proposing solutions. There were class discussions where each group presented their analysis and proposed solutions, allowing for broader learning and knowledge sharing, which was the starting point for the story they had to create.

The teachers were there for them to provide information and to guide them throughout the process of understanding and learning, but it was the fact that they could rely on each other for help that motivated them to continue. The teachers provided personalized support, advice, and encouragement, helping students navigate challenges and stay motivated. They also provided regular feedback which ensured that students could adjust their approaches and strategies, encouraging deeper involvement.

The collaborative activities allowed them to develop communication skills and required critical thinking, which allowed students to view problems and solutions from different perspectives. It created an environment of mutual respect and trust, as students learned to provide constructive feedback and support one another's learning process. Providing continuous feedback on collaborative activities helped students understand their strengths and areas for improvement, encouraging them to stay engaged and committed to improving their performance. Building a sense of community among students through team-building activities and collaborative projects created a supportive environment that encouraged deeper involvement and commitment. By working together towards common goals, students became aware of their strengths and weaknesses, which increased their commitment to the learning process. The constant exchange of ideas helped students stay engaged and committed to the collaborative learning process. By working on a project that had tangible outcomes (the consumption of NPS and its effects), students were more motivated to invest their time and effort, thus deepening their involvement and commitment. This project raised their awareness towards the subject, helping them to create educational materials for the

didactic units and this required to apply theoretical knowledge to practical scenarios, enhancing their learning and commitment. Students saw the real-world implications of their work, which fostered a deeper commitment to the learning process. This relevance to real-world contexts ensured that students were not just passively consuming information but actively engaging with it in ways that had practical implications. They had the opportunity to share their knowledge and their experience and to learn from one another.

In addition, at the end of the practical activities carried out within the project, the students were asked to express their opinion about these activities and about the utility of this project.

Thus, Drăgan M. considers that 'for me, the INES project has meant a real challenge, to talk about a subject that is taboo, but which is still on everyone's lips, to learn about the countless psychoactive substances and how they can affect the human body, to enter a diversified group and listen to everyone's opinion and then to put their ideas on paper. It has been hard and tiresome, but it has also helped me to have a new perspective on people and the world around me.'

Popa D.: 'For me, the INES project has been a new experience during which I have learned to work in a team with new people and to listen to the point of view of each member of the group. I have learned about the complexity of drug-related problems and how important their prevention is. We have learned more information about the types of substances and how they can work, how to protect ourselves from these substances and the people who consume them. During the project there have also been difficult moments, but in the end it has been a beneficial experience from which we have learned important things.'

Iacob E.: 'As a result of my experiences with the INES project, I have learned to appreciate different opinions about a person's lifestyle. Also, this project, despite the hours we have worked, the stress, the hardships and the frustrations, has taught me how to proceed in approaching the wrong entourages, how to defend myself from substances that can affect my life and future and finally, how I can help my family, friends and loved ones to protect from these new drugs.'

Taking into consideration their opinions, we have to say that the knowledge and the skills that they have gained these years, during the project, can be applied in real-life situations and that everything they have created can be useful for them in the future, but also for the school. Probably, it would have been easier if the theoretical concepts had been explained taking into account their age and knowledge, but they tried to do their best and to work with those concepts and to produce materials. They have learned to work in groups with their classmates, but also with students from other classes involved in the project, which has contributed to their academic and professional

development. It was difficult for them, at the beginning, to work on this particular topic because of their previous knowledge on the subject and because of their different opinions, but they continued working and this was a good thing for their academic progress. It was interesting to be a part of an international project because they had the chance to interact with people from other countries (even though they were not physically present at the Multiplier Event), but at least they could hear and compare different points of view of the same topic and they could express their opinion in a foreign language about the subject, which gave them trust that they could speak in public in other language than their own.

Engaging the students in collaborative learning activities focused on NPS has required a different approach from the one in the classes that integrated structured activities, interactive environments, project-based learning, reflective practice, and a lot of support, which has increased the importance and the impact of such projects on their academic future, but also on their life and on the life of their loved ones.

Lens 3: Colleagues' experiences

As teachers, it is crucial to seek and integrate the feedback from our colleagues in our teaching practices. This process increases the quality of teaching and fosters continuous improvement and professional development, so we tried to find different strategies to gather feedback and reflect on our teaching methods. We invited our colleagues to provide constructive feedback through discussions and observations, ensuring that the feedback environment is non-judgmental and supportive. That made us feel comfortable and offered us the occasion to share our opinions about different aspects of teaching about NPS in our classes. We invited our colleagues to talk about the teaching strategies and to provide honest feedback, in order to help us to develop action plans. We implemented the action plans and regularly reviewed our progress, adjusting the plans as needed based on ongoing feedback and reflection.

In order to be more efficient, we scheduled regular meetings to discuss teaching practices, share resources, and provide feedback. These meetings focused on specific topics related to NPS, such as effective teaching strategies or recent research findings. The ones who participated in online meetings related to the project informed the others about the teaching strategies and provided feedback. We also had informal discussions with colleagues to talk about teaching practices and share feedback. These informal meetings led to more open and honest conversations.

Each of the teachers involved in the project received feedback from the colleagues in the process of designing the activities of the didactic units, which allowed us to improve our teaching strategies and to share information that could be used in the project.

In addition, there was collaboration between our project team and the representatives of the university, which helped us to learn more about the NPS and share the didactic aspects of the topic. In what concerns the theoretical aspects of the subject, we used the materials provided by the INES platform and we tried to find information on the Internet and to help each other.

We also collaborated on curriculum development that could ensure that didactic units on NPS were comprehensive, relevant, and effective. We had lesson planning sessions to design didactic units on NPS and we created a folder of teaching resources, lesson plans, and assessment tools. This allowed colleagues to contribute and access a wide range of materials, fostering a collaborative approach to curriculum development. We used the INES platform to find the necessary information for the project, Teams to communicate in the project, Slides to make the presentations. We also find useful Google Docs, Google Classroom, which we use during our activities from our school work.

There was a mix of colleagues from different disciplines or teaching backgrounds. This diversity led to a richer discussion and more varied perspectives. The team of our school was formed of teachers from different areas: Romanian and English language, Romanian and French language, Religion, Physics, Technical subjects, Informatics, which helped us to have different points of view on the topic, but also in the process of teaching and learning.

In order to improve our teaching practices, we collected and analysed student feedback on didactic units and teaching methods. They gave us valuable perspectives on how the didactic units were impacting their learning. This provided valuable insights into what was working well and areas that needed improvement. It determined us to question our assumptions, to explore alternative strategies, and to consider the impact of our teaching practices on student learning. We engaged students in real-world projects that applied classroom learning to community issues (gamification and the creation of different materials).

In order to promote meaningful discussions, knowledge sharing and to improve teaching practices regarding NPS, we used a variety of collaborative strategies and several tools. These approaches created a dynamic and supportive environment which led to professional growth and effective teaching.

We would like to conclude by presenting the point of view of two of our colleagues involved in the INES project:

As a result of participating in the activities of this project, I realized that I needed to use technology more in the implementation of teaching units. The fact is that the discipline I teach, Romanian language and literature, lends itself rather to classic teaching methods, but I must not exclude methods that involve technology as much as possible, such as dedicated platforms, Kahoot, etc. Working with colleagues who teach different subjects, I realized that we needed to collaborate more actively to achieve the best possible results. For example, in the didactic unit that I had to carry out, the most difficult thing was to obtain the necessary information because the topic was not familiar to me and I had to turn to sources of information from the internet. Talking with the colleagues involved, I found out that they also ran into the same problem: quite schematic information about the theme of the project in general and of the teaching unit in particular. Thus, everyone had to turn to the internet, the main source of information. As a collaboration strategy, I think that the most appropriate could be the debate because it involves identifying the advantages and disadvantages, expressing pro and/or con points of view. In order to promote the exchange of information, the most appropriate thing would be meetings that involve the sharing of experiences or even the presentation of real cases/films inspired by reality. In order to collectively improve teaching practices regarding NPS, I propose to discuss the topic of NPS consumption more frequently (at least once/module) and also to invite specialists in the field during counselling hours. It should be noted that students receive education not only within the family and school, but also in society, and then measures should be imposed at the macro level. It is not enough for us in school to prevent the consumption of NPS as long as anti-models are promoted at the level of society. And here I am referring to music festivals where, most of the time, the consumption of NPS cannot be stopped. It is our duty to do prevention, but it is not in our power to prevent this phenomenon that has grown. (Dinu M., Romanian and French teacher)

During the implementation of the didactic units, we decided, from time to time, to work in teams of 2 teachers on the activity of a class of students - in this way we could actively participate and receive good feedback on the teaching methods and we could observe how the topics on NPS were approached by teachers of various specialties and their points of view. This was possible because of the participation of teachers of different specialties in the project: Romanian language, French language, Physics-Chemistry, Construction Installations. As these are different subjects, the teaching strategies have been adapted according to the discipline. Thus, in my case as a physics-chemistry teacher, I focused on direct discovery, problematization, brainstorming, heuristic conversation, the assault of ideas, etc. The team of teachers involved in the project, each with their own specialty, was

able to analyse and propose specific cases through the interdisciplinary perspective. This allowed each of us to have different contributions and points of view, as well as proposals for integrating topics related to NPS into the curriculum. As a result, this feedback allowed us to adapt our working methods in order to achieve maximum efficiency in the instructional-educational process, regarding topics related to NPS and beyond. In conclusion, each teacher had his own contribution in adapting the teaching strategies and shared them with the colleagues in different workshops organized periodically. (Schmidt A. - Physics and Chemistry teacher)

Lens 4: Theoretical Lens

The concept of 'curriculum negotiation', also known as integrated, co-designed or co-constructed curriculum, involves teachers and students working together by discussing, shaping, and deciding on the content, methods, and assessments that make up the curriculum. Since the students had a say in their learning process, they felt a greater sense of ownership, which led to higher levels of engagement and motivation. It allowed them to connect their personal interests and real-world experiences to their learning, making the material more relevant and meaningful to them. Curriculum negotiation encourages students to think critically about their process of learning because they are engaged in decision-making, considering various perspectives, justifying their choices and understanding their role in the learning process. It also builds a connection between teachers and students and creates a collaborative classroom environment.

At the beginning, the students, as well as the teachers had to fill in surveys proposed by the university professors in order to discover their prior knowledge related to NPS. Besides the surveys they helped us, through their expert presentations, to understand the phenomenon related to NPS consumption. Our participation in the online meetings hosted by universities provided access to expert knowledge and the latest research findings on NPS, which gave the teachers a starting point in the learning process.

After that it was the time for the teachers from our team to work with each other and with the students involved in the project. The teachers outlined the learning objectives and expected outcomes, helping students understand what they will gain from the unit. Some students were curious when introduced to the INES didactic units, others were sceptical about the topic, mostly because it was something different from the things they were used to. But their interest grew when they saw the relevance of the material and the fact they were involved in the decision-making process. Then, both parties had to study the information that was on INES platform, and it was a bit difficult for the students to understand the theoretical concepts, so it was necessary for the teachers

to explain them and to simplify the information, helping them to approach the situation, while ensuring that the curriculum remains coherent, avoiding a fragmented learning experience. That is why we used differentiated instruction strategies to address the diverse needs and abilities of students, ensuring that everyone can access and benefit from the information. Since one of our teachers is a Physics and Chemistry teacher, she tried to link the topic of NPS with her subjects, in order to make it easier for the students to understand the concepts. For a better understanding, we incorporated multimedia resources such as YouTube videos, Ines platform interactive websites and quizzes to enrich the learning experience. In this era, the integration of technology in the project was highly appreciated, as it made learning more accessible and engaging. We organized discussions on topics such as harm reduction and the role of law enforcement in managing NPS. There were brainstorming sessions to find out students' ideas about NPS, which were relevant for the implementation of the project, providing support to ensure equitable learning opportunities and explaining the relevance and importance of the content. But when they understood the concepts and started working together with the teachers for the didactic units, they felt more and more involved, and the creation of the story gave them the possibility to put their knowledge into practice and become more creative. We organized students into small groups for collaborative projects, encouraging teamwork and their contributions. It was necessary to set some boundaries for the students to understand their roles and responsibilities and to ensure educational standards and learning objectives were met and that all the students had an opportunity to participate in the negotiation process. They had the possibility to choose if they wanted to be part of the team creating the story for the game and feel safe to express their opinions, to support each other and to contribute to their learning. This made learning more experiential and impactful and helped them to understand the topic of NPS. We encouraged students to take on leadership roles within the creative team, promoting a sense of responsibility and took into consideration possible disagreements or challenges that appeared during the collaborative process. During the project, students have become more aware of their learning processes, and that increased their ability to transfer what they have learned into new contexts. Students reacted positively when they found the content of the modules relevant to their lives, especially the impact of NPS on health and society and when they had to contribute to the storyline.

In addition, after finishing the storyline students participated in the contest promoted by Swing Tree that motivated them to be creative and to share their opinions and to observe the way in which students from other schools abroad were thinking about the topic. They also took part in a contest about different projects from the schools in Braşov, where they had the opportunity to educate the

public about the risks and realities of NPS and to put into practice what they had learned so far. These activities helped students apply classroom knowledge to real-world situations, enhancing their understanding and impact.

For the teachers, it was important because they could reflect on their teaching practices and work with other teachers, in order to improve their strategies and find innovative approaches, as well as with the students to co-design parts of the didactic units, especially the assessment part (creating poems, presentations, songs, and comics). Those projects and activities improved students' collaboration and communication skills because they needed to explore NPS topics and present their findings. There were dialogues between teachers and students to discuss the objectives and potential benefits of incorporating INES activities into the curriculum, showing that their opinions were valued and respected. Both students and teachers could provide feedback about what was working and what needed improvement. Based on feedback, teachers made adjustments to improve the units for the students' needs and preferences. That is why we collaborated with other teachers to share best practices, resources, and insights for improving the didactic units. We tried to review the existing curriculum to identify the areas where INES project activities could be integrated, since we could not come up with a new curriculum. Since our team was composed of teachers of different specialties, we tried to integrate NPS-related content across various subjects. Since the activities happened during the school year and some of the students were preparing for the exams, they sometimes felt overwhelmed by the workload and it was difficult for them to finish their tasks in time, so we, the teachers, had to adjust our work in the project to their needs and provide additional support, ensuring equity in learning opportunities.

Curriculum negotiation significantly enhanced the quality of teaching by fostering student engagement, promoting critical thinking, building confidence and taking into consideration diverse learning needs, which helped create an interactive, relevant, and supportive learning environment. It brought a positive reaction on students, who were willing to participate and to learn a lot about NPS and improved learning outcomes, while also strengthening teacher-student relationships. The activities of the INES project promoted inclusion and openness to the local community, involving parents, families and other community members in a large health education project, but also contributed to the professional growth and development of teachers and that of the students. The INES project created opportunities to go beyond the traditional school context, significantly enriching the educational experience by involving students, teachers and university professors.

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Chapter VII. INES Pedagogical Planner

Luca Ferrari, Marta Bonino

Analysis of the Results of the INES Project Questionnaires: Students' and Teachers' Perceptions of Active Teaching-Learning (ATL) Practices

By Marta Bonino

Introduction

The following paragraph analyzes and compares the results of the questionnaires administered to students and teachers, during the project lifecycle, offering a detailed overview of their perceptions and emerging didactic ideas.

Questionnaire 1: Engagement Activities | Teachers

Name of Module

Name of Didactic Unit

School name

Teacher(s) involved

Create five open-ended questions that teachers could use to initiate/support classroom debates related to the Didactic Unit

Idea: a brief description of the activity (how to implement it in the classroom)

Learning Goals

Teaching-learning Strategies (e.g., Role Play, Cooperative Learning, Inquiry-Based Learning, etc.)

Group Organization: how students work in groups and individually

Estimated Timing: related to the implementation

Digital Tools/Platforms: If used to support the students' activities

Upload your slide package: max 15 slides per Didactic Unit

Questionnaire 2: Engagement Activities | Students

Name of Module

Name of Didactic Unit

School name

Student(s) involved

Idea: a brief description of the activity (how to implement it in the classroom)

Group Organization: how students work in groups and individually

Estimated Timing: related to the implementation

Digital Tools/Platforms: If used to support the students' activities

Digital resources (if any) created by students

Micro Level: Analysis of Individual Schools

Mircea Cristea Technical Institute of Braşov (Romania)

The student sample from Braşov provided many responses, characterized by a certain level of uniformity. Some answers were brief and not particularly elaborate, suggesting at first glance a need for deeper critical reflection. However, this uniformity may stem from collaboration within student groups, which reduces individual variability. While this may seem limiting, it also highlights a learning environment that fosters dialogue and peer-to-peer exchange.

The teacher sample from the same institution shows familiarity with traditional teaching principles, still relying on teacher-centered strategies. A positive development could involve implementing

activities where students' contributions extend beyond simple material re-elaboration, even though this serves as a strong foundational step.

There are also innovative proposals that can serve as models for teachers attempting to decentralize their role and innovate their practice. The ultimate aim is to enrich the teaching-learning process by giving students more autonomy, thus encouraging independent work and helping them achieve higher levels of competence.

Zarco Technical Institute of Porto (Portugal)

Students from Porto demonstrated a solid understanding of the topics covered by the INES project, offering diverse and well-thought-out responses. Although some activity proposals used recurring formats such as group work and multimedia presentations, these approaches reflect a positive shift toward more interactive and engaging teaching methods.

The teacher sample primarily designed activities involving brainstorming, group work, and result sharing, aligning closely with Active Learning principles. For instance, using digital platforms, like Kahoot or Canva, for individual student re-elaboration fosters creative engagement. It is essential to further develop classroom works, so that this innovative approach moves beyond surface-level activities, allowing students to cultivate critical thinking and problem-solving skills.

Salvemini Economic Technical Institute of Bologna (Italy)

Students from Bologna provided responses that reflect not only a strong understanding of Active Learning principles but also well-reasoned arguments that showcase their underlying pedagogical thinking. This level of reflection suggests an effective application of Active Learning, empowering students to critically analyze and synthesize information.

Teacher responses from Bologna show a diverse and flexible approach to implementing teaching strategies. The proposed activities indicate an ability to tailor lessons to specific classroom contexts, addressing individual needs and available resources. This demonstrates both a solid grasp of Active Learning techniques and the capacity to align teaching methods with educational goals. The chosen strategies range from initial brainstorming, guided by critical questions, to more immersive activities like Role-playing or Story-writing, requiring higher levels of engagement and fostering advanced learning skills.

Compared to other schools, the presentations from Bologna's teachers are more descriptive yet less structured. While they mainly focus on the visual materials used in class, without detailing the

Didactic Unit phases, timing, or resources, the work's quality is evident from the variety of strategies employed and the teacher's ability to engage students in dynamic and well-structured activities.

Macro Level: Comparative Analysis

The comparison across schools reveals differences in familiarity with and application of Active Learning principles. Salvemini students exhibit a higher level of mastery, demonstrated by their detailed and well-structured responses, indicating effective classroom implementation of Active Learning by their teachers.

Zarco students also display a strong understanding of the topics, laying a solid foundation for further exploration of practical applications, which could be enhanced with more innovative tools to maximize their learning potential.

Mircea Cristea students provided a large number of responses, showing significant effort, though some were more concise. The similarities in responses suggest a high level of collaboration, presenting a valuable opportunity to promote individual critical thinking and greater autonomy in learning.

Among teachers, a difference emerges in how activities are designed and described. Zarco and Mircea Cristea's teachers offered more detailed explanations of the Didactic Units structure, possibly indicating greater adherence to INES project guidelines. Meanwhile, the Bologna teachers' presentations were less comprehensive but revealed, through the questionnaires, effective and well-established teaching strategies.

Conclusion

The data analysis highlights the positive impact of the INES project on the participating schools, encouraging both students and teachers to explore new teaching and learning methods. While challenges and differences emerged, the project has fostered greater awareness of Active Learning's importance, promoting a more participatory and reflective approach to education. This progress marks a step forward toward a more flexible and innovative educational system that better addresses students' needs and prepares them for the future.

Pedagogical Planners: a Tool to Formalize and Share the Design for Learning²

By Luca Ferrari

The idea of using digital environments to support teachers in didactic planning is a mature experience. Starting from the first decade of the 2000s, a series of scientific contributions (Agostinho, 2009; Conole & Fill, 2005; Conole et al., 2008; Dalziel, 2003; San Diego et al., 2008) and prototypes – Pedagogical Planners – developed to increase the skills of didactic planning mediated by the use of digital technologies (Technology Enhanced Learning) have been developed and spread in the international context. While there has been a diffusion of generic digital tools for planning, dedicated digital environments to guide teachers in the planning process are lacking (Masterman, 2011). That is, developing software applications that can perform scaffolding functions in the teacher's decision-making process (starting from the ideation phase), and are capable of considering the variables involved in learning - e.g. learning objectives and outcomes, student characteristics, teaching approach and assessment methods, as well as the activities that students will carry out - making it easier to fill that gap between research and practice that often remains simply because advanced design practices are considered too complex (also in terms of time). In any case, research has moved towards a classification of Pedagogical Planners (PPs), identifying the degree of support to teachers during various functions (e.g. Cameron and Campbell, 2010):

- guiding teachers step by step in making theoretical decisions regarding the development of teaching activities and experimenting with new teaching-learning strategies;
- providing project ideas in a structured way to facilitate understanding of the various components of a project;
- describe teaching experiences by offering methodological perspectives that can connect pedagogical philosophies, research-based evidence and experiential knowledge;
- share existing repertoires of teaching-learning activities and reuse them for different purposes;
- suggest mechanisms to extract good practices and learning meta-models;
- contribute to the creation of teaching projects intended for and directly usable by students;

² This paragraph is taken and partially adapted from: Ellerani, P., & Ferrari, L. (2024). The Contribution of Generative AI Ecosystems in Micro-Instructional Design: Opportunities and Limitations. *Formazione & Insegnamento*, 22(1), 117–124. https://doi.org/10.7346/-fei-XXII-01-24_13

- codify projects by supporting an iterative and fluid design process.

Based on this proposal - which is not exhaustive - several PPs prototypes have been tested. The prototypes allow teachers to guide the design and implementation of teaching-learning activities by enhancing, in an online or mixed scenario, also some teaching innovation techniques (Dillemburg 2002; Pozzi and Persico, 2013; Ferrari, 2015). An illustrative summary of the possible functions is the following:

- define modules, teaching units, and lessons through a guided, digitally mediated path, which offers some specific methodological and didactic suggestions programmed in the software (examples: London Pedagogical Planner, Phoebe);
- visualize in graphic form (map, diagram, etc.) the design of the teaching path both at the macro level (curriculum) and at the micro level (in class or in mixed mode) (examples: LAMS, PROPIT), and update the path;
- accompany the teacher in the definition and implementation of specific methodological approaches, enhancing active learning approaches, such as inquire based learning (SOLE).

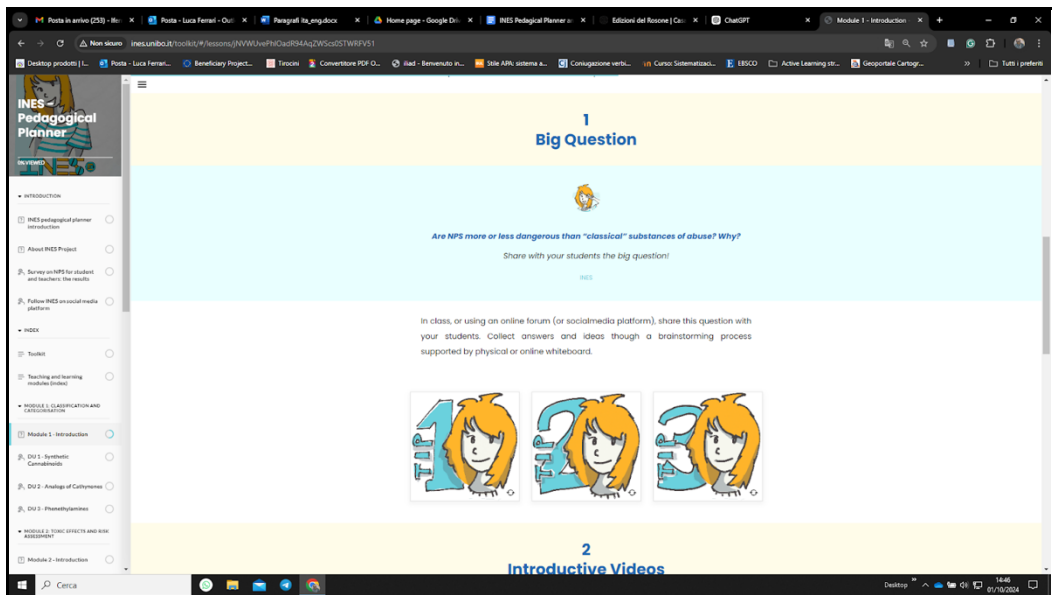
INES Pedagogical Planner

By Marta Bonino

The INES toolkit is a pedagogical planner addressed to secondary school teachers who intend to design and implement interdisciplinary teaching-learning experiences on New Psychoactive Substances (NPS). The toolkit, in particular, aims to support teachers in the ideation phase by providing a clear and feasible design framework and presenting examples and teaching resources that start from the hands-on teaching experience of teachers involved in the INES project.

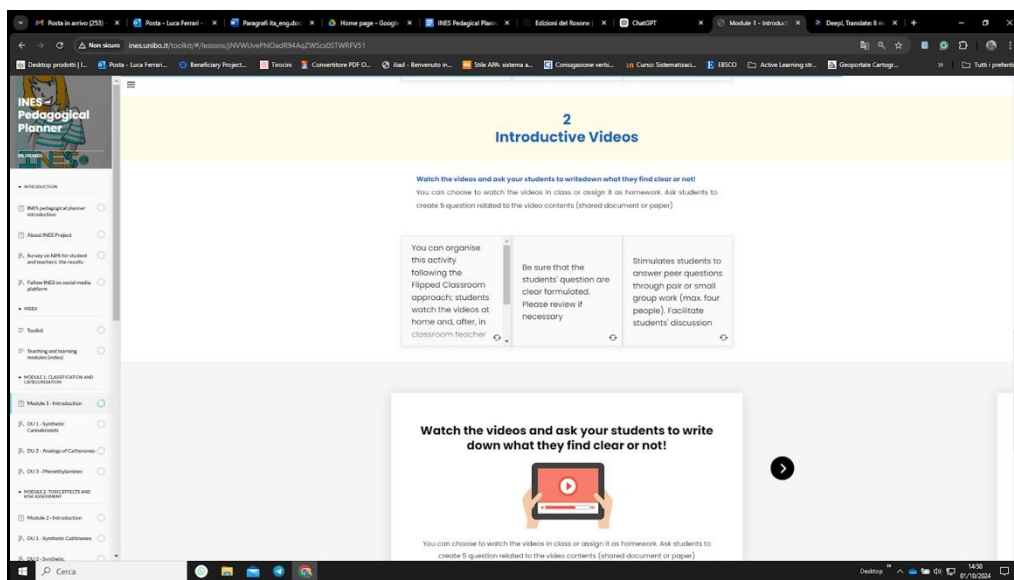
The term Pedagogical Planner refers to “digital environments developed ad hoc to support teachers in making the teaching-learning process visible (and methodologically grounded), from conception to implementation” (Ellerani & Ferrari, 2024). Using artificial intelligence, these tools provide an organizational framework that allows teachers to detail the educational process, including resources, activities, assessment methods, and teaching strategies.

The construction of a Pedagogical Planner follows several structured steps: the first is the definition of learning objectives, which must be clear, measurable, and relevant. Once these are defined, the teacher selects the teaching methodologies and strategies to use, such as lectures, group work, problem-based learning, real-life tasks, and more.



Another key element in creating a Pedagogical Planner is the selection of teaching resources, which can include traditional materials (books, articles) or digital ones (videos, online platforms). The teacher also plans the time allocated to each phase, breaking the process into distinct moments, such as introducing the topic, conducting activities, and carrying out assessments. It is crucial to define the assessment methods, including diagnostic evaluation to tailor the course based on the student's prior knowledge, formative evaluation to monitor progress, and summative evaluation to measure achievement of the objectives.

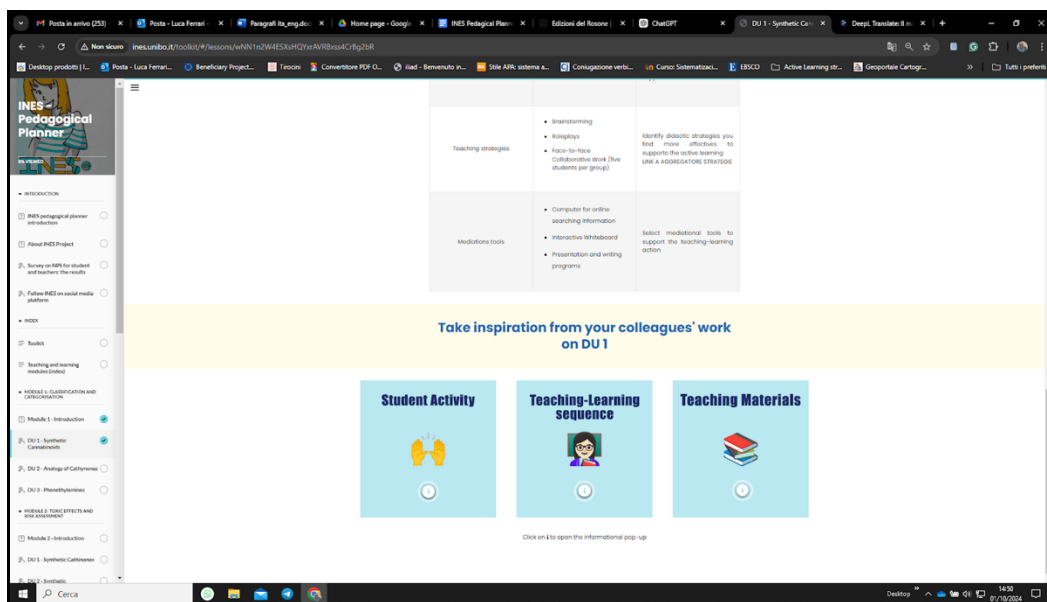
The primary strength of the Pedagogical Planner lies in its ability to make explicit the pedagogical reasoning behind a sequence of lessons, fostering more conscious and targeted planning. Moreover, it helps integrate various active learning methodologies, promoting attention to the diversification of activities and the personalization of teaching.



Another positive aspect of the tool is its flexibility, enabling teachers to adapt it to different educational contexts and specific student needs. Additionally, its capacity to stimulate reflective teaching encourages a more strategic approach to instruction, making teachers more aware of their methodological choices.

The Pedagogical Planner also has significant potential for promoting collaboration among teachers. It creates a collaborative digital environment where educators can share their teaching practices, facilitating the dissemination of best practices and fostering educational innovation. This exchange of experiences broadens teachers' horizons by giving them access to new strategies and methods while fostering an interconnected pedagogical community. This process can be further enhanced through professional training activities, ensuring the effective implementation of innovations. Such an integrated approach, combining technology and collaboration, enables teachers to transcend the limitations of individual school contexts and form networks of knowledge and support. In this way, individual experience becomes a collective resource, contributing to the improvement of the educational system as a whole.

On the other hand, one of the common challenges encountered is the initial complexity of using the tool, particularly for staff members unaccustomed to technological aids or structured planning practices. However, while the need to familiarize oneself with the terminology and functionalities of the Planner may pose an initial barrier, its potential for efficient and effective use is very promising.



In the context of the INES project, teachers from the three participating schools—Mircea Cristea Technical Institute in Braşov (Romania), Zarco Technical Institute in Porto (Portugal), and Salvemini Economic Technical Institute in Bologna (Italy)—used the Pedagogical Planner, which was developed jointly by universities in their respective cities, to design their teaching units. The collected data reveal that teachers approached the tool differently, depending on their cultural context and the specific characteristics of their educational systems.

At the Mircea Cristea Technical Institute in Braşov, teachers experienced some difficulty adapting the Pedagogical Planner to their teaching practices, which have traditionally been more lecture-based. The proposed lessons were somewhat similar to one another and closely followed the examples provided by the platform. The resulting teaching units primarily combined lectures with activities that required student elaboration, though more complex interactive methods, such as simulations or group work, could benefit from further development.

Teachers at the Zarco Technical Institute in Porto demonstrated greater ease in adopting the tool, proposing a wide range of active learning strategies. Their designed units reflected a focus on student participation and the use of digital technologies, including various collaborative platforms and presentation tools.

At the Salvemini Economic Technical Institute in Bologna, teachers approached the Pedagogical Planner with confidence and awareness. Their designs were innovative, including interesting problem-solving activities and role-playing. Another distinctive feature of these designs was their

integration into a broader plan aimed at creating a role-playing game, progressively constructed throughout the course, with each teaching unit contributing to its development.

Overall, the adoption of the Pedagogical Planner fostered a deeper and more intentional reflection on lesson planning in the participating schools, encouraging teachers to carefully consider the structure and objectives of their lessons. The tool facilitated a more strategic and diversified approach to teaching, though some challenges remain, particularly regarding the need to become familiar with its functionalities.

Although students were not directly involved in the use of the Planner, they were the primary beneficiaries of the increased variety of teaching activities. The tool enabled teachers to introduce more engaging and active learning methods, adding dynamism to classroom activities. Notably, students were involved in the ideation phase of the activities and participated in critical reflections, providing feedback that further enriched the learning process.

In conclusion, the Pedagogical Planner proved to be a valuable tool for improving the quality of lesson planning, although adequate training is necessary to ensure its optimal use. While indirect, student contributions played a crucial role in the success of the planned activities, highlighting the importance of a teaching approach focused on active and collaborative learning.

Future Development of the INES Pedagogical Planners with Generative AI

By Luca Ferrari

As a result of the recent mass diffusion of artificial intelligence (AI) in various areas of human experience, there has been rapid growth, including in the educational field, of numerous tools (especially generative AI) aimed at supporting, facilitating, and optimizing the teaching work of educators. These tools can be used, for example, in the design of differentiated lessons, in simultaneous problem-solving through interaction with conversational agents, in the production of educational resources and teaching materials, and in the creation of teaching-learning experiences that promote active student learning. Consequently, Pedagogical Planners are also influenced by AI and integrated with it, thus opening new research opportunities in the pedagogical field (Ellerani & Ferrari, 2024).

Although the limitations identified in the 'first generation' of Pedagogical Planners—low dissemination, rigidity in the stages of conception, planning, and evaluation—are now partially overcome by AI interaction systems, which allow teachers, dynamically, not only to plan their teaching actions but also to query these systems (through conversational agents) throughout the

entire teaching-learning process, the challenge remains to understand and accompany these systems daily in instructional design to demonstrate their impact on teaching quality and teacher well-being.

The integration of AI systems into Pedagogical Planners will help teachers make the most of available resources by constructing innovative and personalized teaching-learning paths based on students' learning needs. The ability to write effective prompts (prompt engineering), capable of meeting in a targeted manner the educational and instructional needs of teachers and the contexts in which they operate, is becoming one of the most relevant design skills to acquire for the use of generative AI systems.

Just as a teacher plans their lessons with a clear vision of educational objectives, prompting requires the ability to formulate clear and targeted commands to fully exploit the potential of AI, ensuring guided learning while always remaining under the control of the designer.

At the end of this paragraph, we present a not exhaustive example of how a generative AI tool (e.g. ChatGPT) could be integrated with the INES Pedagogical Planner. The idea is to support the teachers during the creation of the lesson plan.



Step 1. Connect to the INES pedagogical planner, <http://ines.unibo.it/course/view.php?id=16>

Step 2. Explore the teaching modules and choose the one you want to focus on, for example, "DU 1 - Synthetic Cannabinoids". Start exploring the features of the module for the class you are working with.

Step 3. Decide whether to build a lesson plan or develop teaching resources. In the example, we decide to build a lesson plan. The basic idea is to exploit generative AI as a support for the ideation process, avoiding the replacement of the teacher.

Step 4. Open "ChatGPT" and write the following prompt (personalize it about the student's group).

Step 5. Continue the dialogue with the chatbot until you are satisfied with the result. Try to be as precise as possible in the prompting construction, including the characteristics of the class, the learning objectives and strategies, and the evaluation methods you intend to use.

Prompt example

Create a lesson plan, starting from this example [http://ines.unibo.it/toolkit/#/lessons/wNN1n2W4ESXsHQYxrAVRBxss4CrBg2bR] that takes into account the following topics [explain them], learning objectives [describe them], teaching strategies [indicate them], times [indicate them], materials [explain them], spaces [describe them], evaluation [describe]. The lesson is addressed to a class [...] consisting of [no. pupils], class characteristics [describe briefly].

Prompt result. This is an example of a “Lesson Plan” produced by ChatGpt

Lesson Plan: Understanding Synthetic Cannabinoids

Class Details:

Class Size: 30 students

Class Characteristics: High school students in grades 11-12, mixed ability, with varying levels of understanding of chemistry and biology. Some students may have prior knowledge of cannabis but limited awareness of synthetic cannabinoids.

Topics

Classification of Drugs:

Discuss traditional categories of drugs, such as stimulants, depressants, and hallucinogens, and how synthetic cannabinoids fit into these classifications as NPS (New Psychoactive Substances).

Chemical Composition and Differences:

Explore the chemical structures of classical drugs versus synthetic cannabinoids, emphasizing how these differences influence effects and risks.

Effects and Risks of Synthetic Cannabinoids:

Examine the psychological and physiological effects of synthetic cannabinoids, including the potential for addiction and unknown long-term consequences.

Learning Objectives

Classify Drugs:

Students will categorize traditional and synthetic drugs based on their chemical structures and effects.

Identify NPS:

Recognize and describe the characteristics of NPS, especially synthetic cannabinoids.

Compare Drug Types:

Understand and articulate the differences in chemical composition and legal status between classical drugs and NPS.

Assess Effects:

Students will analyze the psychological and physical risks associated with synthetic cannabinoids.

Evaluate Case Studies:

Students will assess real-life case studies related to synthetic cannabinoid use, discussing implications and outcomes.

Teaching Strategies

Interactive Lecture (20 min):

Begin with a PowerPoint presentation that includes videos and infographics on drug classifications and the specifics of synthetic cannabinoids.

Group Research Activity (25 min):

In groups of 5, students will research specific synthetic cannabinoids using the provided "NPS identity cards" and create a brief presentation on their findings.

Role-Playing Scenarios (20 min):

Assign roles (e.g., healthcare provider, user, law enforcement) for students to simulate a discussion or debate on the risks and regulations surrounding synthetic cannabinoids.

Kahoot Quiz (10 min):

Conclude the lesson with a quiz to reinforce learning and assess understanding of key concepts.

Materials

PowerPoint Presentation: Visual aids and videos to explain drug classifications and NPS.

NPS Identity Cards: Informational cards that provide data on various synthetic cannabinoids for group research.

Online Resources: Access to scientific articles and reputable websites for students to gather information.

Kahoot Platform: An interactive quiz tool to engage students and assess learning.

Spaces

Classroom: A space for lectures and discussions, equipped with an interactive whiteboard.

Group Work Areas: Designated spots for collaborative activities where students can gather and research together.

Computer Lab (if available): For online research during group activities.

Times

Total Lesson Duration: 90 minutes

Interactive Lecture: 20 minutes

Group Research Activity: 25 minutes

Role-Playing Scenarios: 20 minutes

Kahoot Quiz: 10 minutes

Reflection and Q&A: 15 minutes

Evaluation

Formative Assessment: Monitor group discussions and presentations to gauge understanding during activities.

Kahoot Quiz Results: Use quiz performance to assess retention of knowledge.

Peer Feedback: Encourage students to provide constructive feedback on each other's presentations during group work.

Reflection Activity: At the end of the lesson, students will write a short reflection on what they learned and how their perceptions of synthetic cannabinoids may have changed.

This lesson plan incorporates various teaching strategies and materials to foster a comprehensive understanding of synthetic cannabinoids while promoting engagement and collaboration among students.

This example shows how generative AI can offer support to the teacher in the process of designing and creating a lesson plan. Despite the enormous potential of these tools, the teacher's design competencies remain a fundamental dimension, and, with the mass diffusion of AI tools, it becomes even more important to qualify. With critical use by teachers, it is certainly possible to bring some benefits to teacher professionalism and daily practice. AI Lesson plans should be used to (Ellerani & Ferrari, 2024):

provide ideas and strategies on how to structure lessons and didactic units (which will necessarily have to be discussed, improved, and reviewed in the classroom);

accompanying to plan, re-design, and evaluate (dynamically) the teaching-learning experience, reducing work time;

facilitate timely interventions (ongoing feedback) by offering solutions (ideas, strategies, operational models to accompany the monitoring and evaluation phases) throughout the teaching-learning experience.

In the face of the use even in teacher education of AI, critical reflection leading to the explication of the pedagogical models considered by AI is necessary. In the face of the evidence and initial reflections posed, it still needs to be pointed out that currently "[such] systems often do not allow for the clarification of what theoretical frames of reference, pedagogical choices, and motivations led to the design of a given learning activity to be proposed to students." The statement (Bottino et al., 2011) is particularly valid (also) to generative AI systems specifically developed for teaching.

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Chapter VIII. Curriculum Integration - Bringing NPS Awareness into the Curriculum: A Negotiated Approach

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Introduction

In the 1990s, the Australian curriculum specialist Garth Boomer and his colleagues developed the concept of negotiating the curriculum. Boomer's (1992) concept of 'curriculum-as-negotiation' emphasises democratic values reflected in the active participation of both teachers and students in shaping the curriculum. This concept aligns with broader curriculum theories that view education as a collaborative and dynamic process rather than static content to be delivered. Boomer's work suggests that education should model a collaborative democracy, valuing inquiry and negotiation, which underscores democratic education and the development of students as active participants in their learning process.

Boomer (1992) also argued that curriculum should be seen as a process rather than a product. This perspective focuses on education's experiential and evolving nature, where learning is a continuous and interactive process. As Green (2021) noted, the negotiation begins 'with classrooms, in the classroom, "giving centrality of the classroom-as-curriculum" linking schools and classrooms with

communities and other constituencies. [...] and so too is truly significant educational change' (p. 221). The negotiated curriculum approach also highlights the importance of making curriculum intentions explicit to students and involving them as active participants. The curriculum-as-negotiation aligns with theories advocating for student-centred learning (Bron et al., 2016), empowering students to have a say in their educational journey (Higgs & McCarthy, 2005). Curriculum-as-negotiation promotes a more participatory and flexible approach to education, where students and teachers co-create the learning experience. This approach is particularly relevant in discussions about democratic citizenship, student voice, and the evolving nature of education in contemporary society.

This chapter explores the relevance and application of Garth Boomer's curriculum negotiation model in contemporary educational settings, particularly secondary education schools. By showing student involvement in the negotiated content of curriculum design, focusing on NPS awareness can enhance the quality and relevance of the curriculum, promote democratic values, develop health literacy skills, and collect evidence on the impact of student participation in curriculum development on students' learning experiences and the overall quality of the curriculum. This chapter also focuses on student engagement, student voice initiatives, and the collaborative partnership between students and teachers in the teaching and learning process, focusing on NPS.

The Concept of Curriculum Negotiation

Garth Boomer's concept of curriculum negotiation emerged from the broader educational discourse of the late 20th century, which increasingly emphasised the importance of student-centred learning and democratic participation in education. Boomer's work, particularly as outlined in his 1992 book *Negotiating the Curriculum: Educating for the 21st Century*, positions the curriculum not as a static product imposed by educators but as a dynamic process co-created by teachers and students. This approach signifies a departure from traditional top-down curriculum delivery methods to a collaborative and participatory model, giving students a voice in shaping their educational journey. Boomer's theoretical foundation is deeply rooted in democratic principles, advocating for a classroom environment where students actively engage in decision-making, developing critical thinking skills and a sense of ownership over their learning.

The relevance of Boomer's approach to curriculum negotiation remains significant in modern educational practices, as Bron et al. (2016, 2022) discussed. They highlighted how Boomer's ideas align with the modern emphasis on fostering democratic citizenship through education. By incorporating student perspectives and approaching the curriculum as a dynamic process, teachers

can establish learning environments that not only convey knowledge but also foster the abilities and attitudes essential for active engagement in a democratic society. The practical application of Boomer's concepts in current educational settings underscores their enduring significance, demonstrating how curriculum negotiation can empower students and promote a more inclusive and responsive educational system.

The theoretical foundations of Garth Boomer's concept can be effectively articulated in the context of teaching and learning strategies aimed at preventing new psychoactive substance (NPS) use among secondary education students. By involving students in the negotiation of curriculum content, teachers can address the issue of NPS use in a way that is both relevant and engaging for students. This approach enables the collaborative development of learning modules that mirror students' concerns, experiences, and needs, making the curriculum more attuned to the specific challenges they face. For example, students might be encouraged to explore the social and psychological factors contributing to NPS use, discuss the legal and health implications, and develop peer-led initiatives to promote awareness and prevention within their school community.

Incorporating Boomer's principles into drug education also empowers students to take an active role in their learning, which can enhance their commitment to making healthy choices. By treating the curriculum as a process that is negotiated and not imposed, educators can foster a sense of ownership and responsibility among students. This approach is particularly important in the context of NPS prevention, where the effectiveness of educational interventions often depends on student engagement and the relevance of the content to their lived experiences. Moreover, by integrating student voice into the curriculum, educators can help students develop critical thinking and decision-making skills, enabling them to critically assess the risks associated with NPS use and resist peer pressure. Ultimately, Boomer's approach supports the creation of a more democratic and inclusive educational environment that is well-suited to addressing complex social issues such as drug use.

The Significance of Addressing NPS in Education

The relevance of early education and prevention in preventing the use of NPS among students aged 15–18 years has been discussed in the literature underlining the need for a comprehensive approach to addressing NPS and for timely interventions and education to mitigate the health and social threats NPS pose (EMCDDA, 2021). It is recognised that 'the impact of different ways of communicating the risks associated with new psychoactive substances is not well understood' (EMCDDA, 2021, p. 14), requiring interventions for schools to communicate the risks based on

scientific evidence. The role of prevention and education in reducing the harms associated with NPS can be highlighted from another angle. Another report, focusing on the UK context, underscores the significance of early intervention and knowledge sharing as key strategies in preventing NPS use among young people, recognising that ‘schools and other education settings should continue to be provided with advice and support on evidence-based practice [and that] schools should be supported with information and resources that are available to ensure that their drug policies are in line with the best practice and reflect the NPS landscape’ (New Psychoactive Substances Review Expert Panel [NPS], 2014, p. 50). Similarly, a United Nations (2014) report emphasised the challenges NPS pose and the importance of early detection and preventive measures. It stressed the need for scientific, evidence-based approaches to reduce demand and prevent use, highlighting the role of education in these efforts.

In this context, educational curricula face significant challenges in effectively addressing the issues enhanced by NPS. One pressing concern is the rapid and continuous evolution of NPS, making it difficult for educational materials to remain current. Additionally, the rapid emergence of new substances designed to bypass legal controls creates uncertainty. The uncertainty surrounding the health risks of these substances adds another layer of complexity to curriculum development. Finally, given their misleading marketing as legal highs, educating people about NPS is challenging. The increasing variety and availability of NPS demand a more agile and informed approach in educational settings to ensure students are adequately prepared to understand their risks and implications.

Leveraging INES Experimentation: Implementing Curriculum-as-Negotiation

The concept of curriculum-as-negotiation can be enacted in various educational contexts to enhance student engagement, promote democratic participation, and tailor learning experiences to individual needs and interests regarding NPS. In so doing, this approach can be applied through several strategies.

Strategies to involve students in curriculum decisions include collaborative curriculum design, inquiry-based learning, interdisciplinary projects, student-led ‘lectures’, and flexible learning pathways.

Collaborative curriculum design is one such strategy, where teachers and students collaborate to co-create the curriculum (Bron et al., 2016). Students are given a voice in what and how they learn by discussing the units of study, assessment tasks, and learning activities. This collaboration

promotes a sense of ownership, as students believe their perspectives are valued, leading to increased levels of engagement and motivation. When students participate in decisions about the curriculum, they are more likely to connect with the material on a personal level, making their educational experiences more meaningful and relevant. This strategy also allows educators to tailor content to the interests and needs of their students, ensuring that the curriculum remains dynamic and responsive to changing contexts.

Another application might be inquiry-based learning (Rose et al., 2024), which shifts the focus from traditional teacher-led instruction to a more student-centred approach. By asking students questions like ‘What do we know already?’ and ‘What do we want and need to find out?’, teachers encourage students to take an active role in their learning process. This method promotes critical thinking and problem-solving as students explore topics of personal interest and negotiate the direction of their learning journey. Students are involved in planning their learning activities, selecting resources, and setting goals, not only deepening their understanding of the subject matter but also cultivating independence and self-regulation skills. Inquiry-based learning aligns well with the principles of curriculum negotiation, as it requires continuous dialogue and reflection between students and teachers, ensuring that learning remains student-driven.

Interdisciplinary projects offer another avenue for applying the proposed approach by requiring students to apply knowledge and skills across different subject areas (e.g. biology, chemistry, history, and literature), allowing them to explore from multiple perspectives (Helstad, 2012). This approach not only meets learning objectives in core disciplines such as biology and chemistry but also enables students to explore topics that resonate with their interests and experiences. Through interdisciplinary projects, students negotiate the curriculum by choosing how they will approach their curiosity, what resources they will use, and how they will demonstrate their learning. This method encourages collaboration among students and teachers across disciplines, fostering a holistic and integrated learning experience.

Student-led ‘lectures’ further exemplify the curriculum-as-negotiation approach by allowing students to present their learning progress and set future goals in collaboration with teachers, developing, for example, digital competencies (Löfving, 2024). This strategy empowers students to take responsibility for their learning as they reflect on their achievements, identify areas for improvement, and discuss strategies for future success. Student-led ‘lectures’ create a supportive and collaborative environment where all stakeholders are involved in the educational process, ensuring that learning goals are aligned with the student’s needs and aspirations.

In addition, flexible learning pathways are a practical application of curriculum negotiation, allowing students to select courses and projects that align with their interests (Van der Heijden, 2023). This approach involves negotiating the curriculum to accommodate different learning styles, paces, and preferences, thus promoting personalised learning experiences. By allowing students to take control of their educational journey, flexible learning pathways help them develop a sense of agency and responsibility, which is essential for lifelong learning and success in an ever-changing world.

Examples of successful negotiation in the INES project include the integration of NPS awareness into the curriculum activities in the three educational contexts. Introducing and adapting the topic of NPS into the curriculum based on student input involved a dynamic, collaborative process that ensures the content is both relevant and engaging. First, academic partners developed a syllabus proposal that addressed key aspects of NPS, including their identification, risks, and societal impact. Once this initial syllabus had been shared with teachers at the partner schools, the next step involved directly involving students by conducting an anonymous survey to gauge their existing knowledge and experiences related to NPS. This survey not only served to map the characteristics of the student body across different schools but also provided crucial insights into their understanding, misconceptions, and areas of interest regarding NPS. By collecting this data, educators could tailor the syllabus to meet the students' specific needs and knowledge gaps, making the educational experience more personalised and effective.

Incorporating student input into the curriculum is crucial in making its content resonate with their interests and concerns. The process of curriculum negotiation – where students have a say in what and how they learn – ensures that the educational material on NPS is not only informative but also meaningful to them. For instance, if the survey data reveals that students are particularly concerned about the social pressures surrounding NPS use, the curriculum can be adapted to include more content on peer influence, coping strategies, and real-life scenarios that students might encounter. This approach transforms the learning experience from a passive reception of information to an active exploration of issues that directly impact the students' lives. Moreover, by involving students in the discussion of how the content should be presented, teachers can choose teaching methods and resources that align with students' preferred learning styles, which can be achieved through interactive workshops, digital storytelling, or peer-led discussions.

The negotiation process extends beyond just tailoring content; it involves co-planning learning paths with teachers and external stakeholders to ensure a holistic approach to NPS education. Once the educational strategies were identified and content collaboratively designed, they were shared and

refined in partnership with schools. This collaborative process not only empowered students by giving them a voice in their education but also ensured that the curriculum was responsive to real-world dynamics and challenges. Creating open educational resources in the form of didactic units, available on a micro-open online course platform, further supported this adaptive learning environment. By continuously engaging students in feedback loops and content development, the curriculum on NPS remained dynamic, relevant, and effective in equipping students with the knowledge and skills they need to navigate the complexities of NPS in their lives.

Didactic and Pedagogical Approaches to Teaching About NPS via Curriculum Negotiation

The implementation of active learning strategies in the INES project, as shown in Chapter V, potentially promoted the learning outcomes associated with the curriculum-as-negotiation approach. These strategies aimed to ensure that students not only acquired knowledge about NPS but also developed the critical thinking, communication, and collaborative skills associated with the concept of curriculum negotiation.

The short, blended course combined both online and in-person instruction, providing teachers and students with flexibility in how they engaged with the content. This approach can increase motivation by catering to different learning preferences and providing more control over the learning process. Additionally, the online component allows for self-paced learning, enabling students to explore NPS topics more deeply according to their interests, which aligns with the negotiation-based approach to tailoring the curriculum.

Another example can be found in the brainstorming sessions, which encouraged students to generate ideas and explore multiple perspectives on NPS issues. This strategy fosters critical thinking as students analyse and evaluate different viewpoints. Students worked together to develop a pool of ideas, enhancing their communication and interpersonal skills. By participating in collaborative activities, students actively participate in their learning, helping them feel more engaged and invested in the learning process. Cooperative learning, particularly the jigsaw method, requires students to take responsibility for teaching their peers, enhancing their understanding and retention of NPS-related content. These methods, driven by democratic principles, emphasised the importance of each group member's contribution, thereby promoting a deeper understanding of collaboration and shared governance. Similarly, debating NPS topics challenged students to research, articulate, and defend positions, enhancing their critical thinking and communication

skills. The debates also provided a platform for students to engage in democratic dialogue, learn to respect differing opinions, and understand the importance of evidence-based argumentation. Discovery-based learning and mind maps also allowed students to explore NPS topics independently, fostering curiosity and encouraging them to take ownership of their learning. These approaches promote problem-solving as students actively seek information and solutions related to NPS. When done collaboratively, mind mapping can also improve teamwork and communication skills.

In addition, Kahoot, an interactive quiz platform, added a gamified element to learning about NPS, which can increase student engagement and make the learning process more enjoyable. It provided instant feedback, helping students quickly assess their understanding and adjust their learning strategies accordingly. Learning videos can offer a flexible learning tool that students can revisit as needed, supporting personalised learning experiences. Project-based learning was implemented in the INES project to encourage deeper engagement with the material, promote teamwork, and develop problem-solving skills among students who collaborated to complete their projects. This approach reflects the principles of curriculum negotiation. Roleplays allowed students to explore different perspectives on NPS issues, helping them to develop empathy and understand the societal impact of NPS. This approach enhances communication skills as students practice articulating and defending different viewpoints.

Concluding Thoughts

From the perspective of curriculum-as-negotiation, the demanding nature of negotiation, requiring teachers to balance various interests and perspectives while maintaining educational standards and objectives, can make the process challenging to manage effectively. While involving students in curriculum design is beneficial, balancing student input with the need to meet curriculum standards and learning objectives can be challenging. Teachers must find ways to incorporate student voices without compromising educational quality. Regarding parental and community involvement, a lack of cooperation from parents and the broader school community to acknowledge or address drug use issues can undermine schools' efforts to prevent drug use.

Another challenge is the lack of adequate training and capacity for teachers to successfully implement the idea of curriculum-as-negotiation in addressing NPS use. Teachers may resist integrating drug use topics into the curriculum due to a lack of training and expertise in handling such sensitive subjects. This resistance can hinder the effective delivery of the curriculum content. Related to teacher training, resource availability is key to implementing student input and

negotiation outcomes. Insufficient resources can impede the implementation of drug use education programmes, as schools may lack the necessary support systems and materials to teach these topics effectively.

Teachers often face the challenge of navigating competing curriculum reforms, which can make effectively integrating negotiated elements into existing curriculum frameworks difficult. The integration of drug use topics must consider the students' cultural and social context. Educational materials must be adapted to align with socioeconomic and cultural conditions in educational settings to be effective. While educational interventions can change attitudes and knowledge about drug use in the short term, achieving sustainable behavioural change requires ongoing efforts and comprehensive national planning.

Addressing these challenges requires a coordinated effort involving teachers, students, parents, policymakers, and the community to develop and sustain effective drug use prevention programmes in schools. Integrating NPS awareness into curricula via curriculum negotiation has significant implications for society, schools, classrooms, teachers, and students.

By educating students about NPS using this approach, society benefits from more informed and responsible citizens better equipped to understand and mitigate their associated risks, which can lead to reduced NPS use and its related social and health costs. Schools adopting a negotiated curriculum demonstrate adaptability to contemporary issues, positioning themselves as responsive to the evolving needs of their students. This approach also enhances the school's role as a hub for critical, real-world education. Classrooms become more dynamic and engaging when students participate in shaping their learning experiences, resulting in a more vibrant learning environment where students are motivated to explore topics that matter to them, leading to deeper understanding and retention. Teachers shift from being mere content deliverers to facilitators of learning, guiding students through exploring complex topics like NPS. This role enhances teacher-student relationships and allows educators to tailor instruction to meet the diverse needs of their students. Students gain a sense of ownership over their education, which can increase their engagement and responsibility. Through negotiating the curriculum, they develop critical life skills such as decision-making, problem-solving, and collaborative learning. They also become better prepared to navigate societal pressures and make informed choices regarding NPS use.

The implications of integrating NPS awareness into a negotiated curriculum extend beyond the classroom, fostering a more informed, engaged, and democratic society. By so doing, the

curriculum-as-negotiation approach is significant for evolving educational practices to address contemporary challenges like NPS use.

Pedagogical Recommendations to Integrate the INES Syllabus into the Mainstream School Curriculum

Below, we provide pedagogical recommendations for schools on effectively incorporating the results of the INES project into their mainstream curriculum.

Point 1: The Importance of Collegial Dimension in Curriculum Design

Curriculum design should not be an isolated task conducted by individual teachers but rather the outcome of a collaborative, collegial process. Teachers, students, families, and stakeholders must engage in collective discussions to create a curriculum that shares clear values and pedagogical goals that reflect the school's vision and identity. This approach ensures that different perspectives are considered, fostering a richer, more inclusive educational environment.

Point 2: Emphasising Interdisciplinary Approaches

Teaching design should not be limited to single-subject expertise but must emphasise interdisciplinary approaches. This approach broadens the learning experience by connecting concepts from various fields, allowing students to see how knowledge interrelates across disciplines. By fostering such connections, students can develop a more comprehensive understanding of the world around them, preparing them for complex real-life challenges.

Point 3: Centring the Curriculum Design on Students

The students, their needs, learning styles, and motivations should be at the centre of every curriculum design. Therefore, the curriculum should be designed around students to motivate them and recognise their prior knowledge, skills, attitudes, and values. Curricular design should focus on creating flexible teaching-learning processes that cater to these individual and group needs. Active participation and contribution aim to foster a democratic knowledge society where education empowers learners.

Point 4: Translating Curriculum into Active Learning Experiences

Curricular proposals should be translated into teaching-learning models that emphasise participation and collaboration. These models must integrate the ideas of teachers, students, and members of the broader community, promoting the agency and empowerment of teachers and students and supporting innovation at the school system level (and not only at the classroom level).

Point 5: Integrating the Syllabus Into the Mainstream Curriculum

Educational activities, including those developed through the INES Syllabus, should be integrated into the regular curriculum rather than treated as separate or extra-curricular. It is vital to avoid training interventions in schools represented by episodic one-off events, resorting instead to teaching activities and experiments based on collaborative co-design processes. The assessment phase should be meaningfully linked to the curricular goals.

Implementation process

Starting with the INES Syllabus, teachers:

Collaboratively discuss how to integrate NPS topics into the mainstream curriculum. Reading the INES book is recommended.

Use the INES Pedagogical Planner to examine the developed teaching-learning paths and draw inspiration from the experiences of other teachers and students. Collegially, share ideas and tools to monitor and evaluate the implementation of the didactic experiences.

Use, reuse, and remix the module contents, including didactic units and teaching-learning resources.

Implement the modules and didactic units by engaging students in collaborative learning processes and fostering active learning strategies.

Modify and enhance (with the student's engagement) the available didactic resources, building on the INES project's experience.

Individually and collectively plan how to evaluate teaching experiences, particularly emphasising formative and summative evaluation. Students' activities should be evaluated in terms of curricular experiences.

During the entire process, reflect on the quality and effectiveness of the didactic experience to improve/modify the NPS topic's integration into the curriculum.

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