

# Surveying students' voices to assess teaching quality at school

## Case studies: Data Literacy initiatives in schools

### Introduction

This case study is one of five developed from interviews with members of school teams and national policy authorities who have contributed to school initiatives focused on the development of teachers' data literacy or the implementation of practices of using data for teaching and learning in schools. The schools are located in five countries: Malta, Italy, Croatia, Slovenia and Greece. The data

literacy initiatives represented in these cases have been implemented at different levels: two of them represent data literacy initiatives developed by schools, one of them has been developed by teachers, and two of them have been developed at national level, with the case studies focusing on how particular schools have implemented it. The purpose of data collection and analysis varies between case studies: in some cases, improving teaching quality is the main focus, in other cases, it is observing and monitoring students' performance, and in one case the focus is on preventing early school leaving.

The intention of these case studies is to illustrate how data can be leveraged to improve education processes and inform education policy at school level. Therefore, we hope they help as inspiration and illustration for other educators and schools. To navigate these case studies, we recommend that you take a look at the yellow text box. Here, you can find a summary of the key characteristics of each of them. Bear in mind that each school is situated in a different location and context. Therefore, to replicate an initiative you may want to modify its activities. We have included a section about "Transferability" which may help in adapting the initiative to your context.

The EVIDALI project<sup>1</sup> (Evidence-Informed Data Literacy for Policy & Practice), coordinated by European Schoolnet, is an Erasmus+ European Policy Experimentation project that brings together ministries of education, regional authorities, research institutes, and teacher training organisations from four education systems (Malta, Castilla y León in Spain, Madeira in Portugal, and Trento in Italy). Its overall aim is to strengthen the capacity of policymakers and practitioners to design and implement effective, evidence-informed data literacy strategies for schools. The project aims to take

#### This Data Literacy Initiative at a glance

**Country:** Italy

**Age of students:** 14 to 19 years

**Level of implementation:** School level

**Focus on the initiative:** Teaching quality assessment, students' survey

**Keywords:** school improvement; teaching quality; surveys; data literacy; data analysis; data protection

<sup>1</sup> EVIDALI project website: <https://evidali.eun.org/>

an early step in understanding how data can be more efficiently utilised to improve teaching and learning processes at schools. This comes at a crucial time for digital education, with the introduction of Artificial Intelligence (AI) in education, new regulations surrounding data privacy, and new approaches to keep young students safe in a digital world. The project examines existing different data literacy initiatives in primary and secondary schools across EU Member States and explores how these initiatives are being implemented in schools.

## School context

Located in the city of Rovereto, in the heart of the Autonomous Province of Trento in northern Italy, the *Istituto Tecnico Tecnologico Guglielmo Marconi Rovereto*, or **ITT Marconi Rovereto**, was founded in 1962. Currently, it serves as an **upper secondary school** with approximately 1,000 students aged 14 to 19 years, in about 50 classes. The secondary school offers several **technology-oriented study paths**, with subjects including Mechatronics and Energy, Automation and Robotics, and Informatics. The school implements a four-year programme, GET4 STREAM focused on preparing students for the intelligent and digital sustainable industry. In addition, the school has a Vocational Education and Training offer, providing Advanced Professional Training. ITT Marconi collaborates with **local companies, research institutes and universities** in order to provide students with an education offer which is updated and that facilitates the transition from school to work and higher education.

Therefore, the school not only counts with a **strong IT infrastructure** (computer labs, dedicated software, technological equipment, etc.) but also its staff has a **high level of digital competence as well as knowledge of statistical analysis**. These characteristics make the Institute a competent institution to develop and sustain a data literacy initiative.

## Implementation

### Data literacy initiative

The data literacy initiative developed at the school ITT Marconi was introduced in 2018 in response to a national law which encouraged the school to assess teaching quality in order to allocate teacher bonuses. The initiative constitutes nowadays a **yearly whole-school data collection and analysis effort about students' perception of teaching quality**, which has transpired its original purpose and is now a **key driver in teachers' professional reflection and in the school's decision making**.

The school has long-standing expertise in data collection and in the administration of surveys to the student population. Years prior to the launch of this current initiative, the school collected students' feedback through surveys which transitioned from paper-based to digital over the years. This previous experience provided the "launching pad" for the current project, which constitutes a "step forward" — both from a technical perspective and from a qualitative point of view. The initiative under discussion **leverages digital environments to ensure ethical data handling and protection**, and enables further **possibilities in the data collection process**, such as introducing a teacher-specific analysis. Furthermore, having run for several years, it has now become possible to carry out **longitudinal analysis of the results**, and to introduce the yearly reports into **structured decision-**

**making at school level.** This initiative constitutes an inspiring case of how digital instruments which are accessible to most schools—that is, surveys — can be used to introduce **evidence-based** decision making and staff reflection.

The **main objective** of the data literacy initiative is to create an **indicator of teaching quality for each teacher** based on students' feedback. This indicator is one of those considered during the annual procedure to allocate teachers' bonuses at the school. To achieve this, the school aims to collect students' opinions on a yearly basis in a structured manner, with guarantees for data privacy and the anonymity of students. However, ITT Marconi understood early on the **potential of such a large-scale data collection exercise** and the initiative has now developed a secondary aim to **support school improvement**. Therefore, the other aim of the project is to **leverage the aggregated data** for teachers' self-reflection, to monitor trends over time, and to identify aspects of the teaching and learning process that require attention from school leaders. Eventually, these three pillars support **improved decision-making and policy development** at the school level.

## Problem identification

In Italy, a **national law** introduced in 2015 (*La Buona Scuola*) included provisions aimed at recognising and **rewarding teachers' merit**. This policy was adopted at Provincial level in 2016 through the inclusion of a specific article in the local school law. Subsequently, in 2017, the Provincial Evaluation Committee issued **Provincial guidelines** on this topic, providing schools with a clearer framework for implementation. Against this legislative and policy background, **ITT Marconi introduced a procedure designed to recognise quality and excellence in teaching** in a fair and transparent way. The aim was to create a system that was as free as possible from bias, while also encouraging teachers' professional development through self-reflection.

The working group at the school in charge of designing this procedure determined that **students' perceptions were an important element in evaluating teaching quality**. They recognised the importance of students' opinions and sought to count with their voice in their decision-making. Based on prior experiences, it was decided to collect this feedback in a **structured and systematic manner** with digital surveys being chosen as the means to collect data. The school counts with reliable digital infrastructure as well as know-how of digital environments and software, making **surveys the ideal data collection tool**. Another decision concerned the sampling protocol, finally settling on **surveying every student** aged older than 14 years— as opposed to sampling randomly selected students or classes. These decisions help ensure the **reliability, comparability and objectivity of the data collected**, and promoted the **transparency** of the whole process.

The working group developed a **survey of 10 questions** which were based on the school's interests and drew inspiration from a questionnaire used by a university among other tools, and from indications by the Students' Council. In the first year, a draft version of the survey was administered to a test group of students from two classes who examined the questionnaire and created mock-answers based on fictitious teachers. This **test-phase** was important to **ensure the clarity of the questions**, with students first reactions to the survey being collected and implemented. Since then, **the survey runs every year with the same 10 questions**— they were only altered during the two years when Covid required distance teaching and learning.

## Activities

The initiative is run every academic year, and it involves most actors of the school community: the school principal, the school heads, teachers, and students. Every year in the month of May, **students complete the questionnaire** and express their perceptions on **each teacher** that instructs them. The questions are the same for each teacher, and students report only about those teachers they study with. Completing the survey takes approximately 20 minutes, and they do so **during school hours in the computer labs of the school**. School teachers are responsible for taking the students to the lab and ensuring they complete the questionnaire. Students who are absent on the day do not take the survey from home, nor at a different day than the rest of their classmates—they do not complete the survey that year. The data loss is not significant, and this decision ensures students' complete anonymity.

During summer, **the school principal analyses the results of the survey and creates an individual confidential report per each teacher**. In addition, the data is used to create a weighted score which is one of the indicators used in allocating teachers' bonuses. Teachers then use this report to **reflect on their professional practice and professional growth**. They may do so individually, in cooperation with school leadership through follow-up private "reflection meetings", together with other teachers at school, or together with students. The school leader does not impose a method for reflecting about the results on the teachers but may follow up with certain departments or teachers if an issue is identified through **longitudinal data analysis**.

The survey is run using a **custom digital platform** developed and managed by ITT Marconi. Therefore, the data is stored in an **internal secure server**. In addition to this software, they use the software which helps organise the classes timetable (to extract data about which teacher teaches which class), tools for statistical analysis, and tools to create **reports and data visualisation graphics**.

The survey has 10 questions. Respondents are **shown the questions one by one** and rate each of their teachers for every question. Students answer each item using a **four-point Likert scale**, with an additional fifth option: "not enough information to answer". The scale refers to **frequency**, with the options being: "Almost always", "Often", "Sometimes" and "Almost never". The 10 items refer to different **indicators of teaching quality** and enquire how often those occur during lessons. For instance, "The teacher uses different teaching methods (lectures, group work, lab activities, etc.)" or "The teacher clearly communicates assessment criteria". Other items enquire about lesson preparedness, classroom climate, learning materials, etc. Once the student completes the questionnaire, their role in this initiative is over. Some teachers may reflect with their class, at the beginning of the academic year, about issues or positive points which emerged from the data analysis.

The confidential teacher reports provide a **yearly snapshot of teaching quality at school**. The results may be compared across departments, classes, and grade levels. The aggregated analysis is shared and discussed within teachers' boards, prompting a **whole-school approach** to reflect on the conclusions. In addition, as the initiative has now run for several years, it is also possible to carry out **longitudinal data analysis** which permits to **monitor the progression of teaching quality, to follow up to identified improvement areas**, and to estimate trends. This data analysis exercise allows for

**in-depth review of teaching practice and informs decision-making at school level**, for example, it may impact policies at school or teaching assignment decisions.

## Use of data

The data collected in this initiative is **quantitative data** about students' perceptions of teaching quality. This data refers to the 10 items explained above, which remain the same every year. Students answer each question for all of their teachers. When they log into the survey website, they must select the class— so that they are presented with the correct list of teachers.

The students' responses in the form serve to create a **synthetic indicator of teaching quality** per teacher. Each point in the Likert scale is translated to a score between 0, an absolutely negative perception of the item, to 100, an excellent perception. Responses to the fifth option, "Not enough information", are not taken into account when building this indicator. In addition, the **database is checked for outlier scores** that may be due to errors or strong students' biases— however, these are included in the analysis to avoid arbitrary adjustments. The weighted scores serve to build a global indicator per teacher, which counts for 25% of the total score to obtain a bonus.

### **Data privacy and confidentiality**

For ITT Marconi, ensuring students' data privacy and the confidentiality of their answers is of great importance. The data collection process places a **strong emphasis on the ethical handling of data, safeguarding students' privacy** and ensuring the data collection is free of biases.

A special procedure has been designed for this purpose. First of all, students complete the survey at school with the school's devices. By preventing them to access the website with their own phones or computers, they ensure that IPs cannot be associated to the respondents. Then, the survey is completed anonymously. When students come to the computer lab, they pick up a **one-time log-in credential** which cannot be associated with their identity. This process ensures that students answer the survey honestly and are confident that their privacy is protected. In this way, the process ensures the authenticity of the data.

The survey is run in a school-managed website, with a tool built ad-hoc for the purpose of the initiative. The **data is saved in an internal server** and can only be accessed by the school principal and staff formally appointed by her. The school principal ensures the strict confidentiality of the data collected, and of the results of the data analysis. Therefore, this initiative is compliant with GDPR\*.

*GDPR stands for "General Data Protection Regulation", more information on: <https://gdpr.eu/what-is-gdpr/>*

While parents and guardians are not strongly involved in this initiative, they are aware of the process. They are informed by school leadership of the purpose of collecting students' feedback, and the parents' and guardians' association is presented the overall conclusions extracted from the survey each year. At the beginning of the school year, they are provided with a detailed consent form which they sign on behalf of their children. This consent form covers different school activities, including the students' survey.

## Challenges and solutions

Challenges faced by the initiative have to do with technical requirements, and with teachers' and students' preparedness. Managing the technical and organisational complexity of such large-scale initiative proves challenging at times, for instance, the school reports the **difficulty of exporting the timetables into the survey**. That is, each student answers the survey for those teachers in the subjects they study. Therefore, **the survey must be tailored per class or study path**— which, at a technical school such as ITT Marconi have a high degree of complexity, especially in upper years. **Specific staffing arrangements**, such as substitutions, teachers with multiple subjects, or temporal staff, must also be given special attention. In this regard, survey managers decided that each educator be evaluated once per student, and not per subject they teach to them. The items in the survey are not specific to the subjects, which makes this a viable option. Non-permanent teaching staff, such as substitute teachers, are not included in the survey as the feedback cannot be relied to them and their bonus is not decided by the school. Another technical aspect which requires great effort is **ensuring the privacy of the data and the anonymity of students**. The school, however, has gone to great lengths to guarantee these, with a detailed procedure being carried out both at the point of data collection, and in the handling of the data. More information in the section above.

Developing data literacy at school level requires **staff and students' preparedness**, which does not come about by merely introducing an initiative such as this one. When the project started, the school leadership made sure to prepare its staff and students for their role, in turn **developing data literacy competencies** among them. At the beginning, teachers expressed concerns about the interpretation of the data and its impact on the bonus scheme. One of their concerns stemmed from the potential of students' biases affecting the scores received. However, the **anonymity of the data collection and transparency in the data processing serves to reassure teachers**. As well, it is important to reassure staff that individual results will not be made public and are confidential. The school leadership worked with the teachers to render the project meaningful to them: making sure the feedback reports could be leveraged for their professional advancement, and **ensuring a feedback process where learning was encouraged, and which was free of any penalisation**. Over time, teachers at ITT Marconi have embraced the initiative and report looking forward to students' feedback. The leadership explains that **teachers actively use the results for self-reflection and discuss them openly** with either the school principal, other teachers, or their students.

It was equally important to prepare not only teachers, but also students. From the beginning, students were on board with the initiative and were glad their voices were heard and considered for school improvement. However, it was important that they not only understood their impact, but also their responsibility. Indeed, **students have perhaps the biggest responsibility in this initiative**: the

feedback provided must be accurate, authentic and free of any temporal biases— both negative and positive. For example, a student may feel a strong affinity for a teacher, but they must report accurately on several aspects of their teaching process and not only about those related to personal relations. In this regard, the fact that **the survey is administered to the whole student population** supports the preparedness of respondents. That is, **repeating the exercise each year contributes to the training of students** who, over time, have reflected on their role and know how to answer the survey appropriately. An important aspect to highlight here is that **respondents are aged 14 years and older**, the school notes that younger students may find it more challenging to reflect on the exercise. This is something to take into account by school seeking to replicate this effort: should the survey be applied to **younger students, questions need to be adapted to their age and comprehension level**.

## Outcomes and added value

This initiative has surpassed its original aim and has now become an integral element of the school's decision-making and policy development. Counting with a stable and reliable method to survey students and assess teaching quality supports teachers' professional development and informs the school leadership about areas of improvement. In addition, the initiative has allowed the **school to develop skills and competences related to data literacy**: data validation, data privacy, survey design, statistical analysis, etc. The long-term nature of the project has allowed for longitudinal analysis and for observing patterns in the data. One such finding, which accounts for the validity of the whole exercise, is that there seems to be a lack of correlation between students' perceptions and a teachers' severity in their grading. That is, teachers who tend to grade students more strictly, do not necessary receive poorer scores. This is a result of the school leadership's effort to prepare students for the data collection, as this indicates they are fair in their assessment and free of personal biases.

## Impact

This data literacy initiative is a well-established quality assurance process which has shaped ITT Marconi's school culture. The project has impacted students and teachers alike: the former feels empowered by having their voices formally recognised and taken into account, while the latter have a yearly "check in" on the quality of their teaching and have advanced understanding of their perception by students. The school leadership counts with in-depth snapshots of the pedagogical quality of its educative offer, being able to aggregate the data by class, department and teacher. They can also observe changes over time, monitoring trends and carrying out predictive analysis. The project has generated a reflective and evidence-based approach to professional development among teaching staff, reliant on data literacy. The project has created an impact beyond the school's campus: results of their efforts are now being promoted at the level of the region, the Autonomous Province of Trento, and at national conferences.

## Lessons learned and recommendations

- **Ensuring ethical data processing and handling** has a wider impact than that on the quality of the conclusions obtained. This effort serves to reassure data subjects (from whom data is collected) and those impacted by the data collection effort (in this case, teachers).

- **Involving the whole school community** creates an atmosphere of collegiality and cooperation, necessary to promote trust in the initiative. Students, teachers, teachers' boards, and leadership are involved in the project which is discussed openly.
- **The school leader has important role to play in the success of such data literacy initiatives**, with their support to teachers being a crucial element of the process. Not only that but ensuring the principal is assigned the protection of the data promotes the validity of the results.
- **Evidence-based quality assurance** renders school improvement and decision-making more accurate and capable of detecting risks earlier.

## Transferability

While the case of ITT Marconi is a well-established and develop data literacy initiative, it is feasible for other schools in different context to replicate the process.

The school highlights the importance of adequate digital infrastructure at school: setting up the digital questionnaire and placing the guarantees for data privacy requires a reliable digital infrastructure at school. In addition, the school needs the capacity to manage and input schedule data. Should a school not count with this in-house, support can be sought externally. For example, they may find support at innovative learning labs in their area<sup>2</sup>. It may be necessary for a school to introduce changes in the process, so that the initiative is adapted to their needs and their context. For instance, a school may disregard the anonymity of the process if they have a different focus; or they may want to create a sampling protocol if surveying the whole school population is not possible; additional roles in the school community may be included in the process, such as non-teaching school staff or parents and guardians. However, regardless of the context of implementation, a key lesson learned for ITT Marconi has to do with the questionnaire itself. They recommend a short survey— theirs counts with only ten questions— which remains stable over time. This facilitates respondents' preparedness and ensures the robustness of the results.

In addition, it is important to note that schools may replicate this effort, surveying students, for other purposes than assessing teaching quality. For example, a school may be interested in surveying wellbeing at school, satisfaction with the schools' facilities, compliance with regulations, etc.

## Conclusion

ITT Marconi undergoes every year a procedure to allocate bonuses for teachers which are primarily used to recognise teaching excellency. Among other indicators, the school has developed a score for each teacher to determine the quality of their teaching. This score is based on weighted scoring resulting from the data collected through a digital survey administered to every student where they can express their perception on the teaching quality of each teacher with whom they study.

The exercise has surpassed its original aim and now serves to support quality assurance and professional development at school. This case study is a prime example of how data can be leveraged

<sup>2</sup> Learning labs are flexible learning spaces which often have IT infrastructure accessible to schools, for more information visit: <https://fcl.eun.org/fcl-network-labs>

at school level and create a wider impact on the school community. The high degree of transferability of this case makes this an excellent guide for other schools to implement data-informed processes at school.

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