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Implementing the ESC within the EDUC European University Alliance

Challenges, successes, and recommendations for the future

EDUCardS – Intellectual Output 4
'1st-year report on the experimentation with the ESC'

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Foreword

EDUCardS is a 3-year project (09/2019 - 08/2022) that brings together the **six founding members of the European Digital UniverCity** (EDUC), a European higher education institutions' (HEI) alliance funded by the European Commission's (EC) call for proposals in 2019. The alliance's members are the following: The University of Potsdam (UP, coordinator, Germany), the University of Rennes 1 (**UR1, coordinator of EDUCardS project** and EDUC-twin H2020 EDUC-SHARE project, France), the University of Cagliari (UNICA, Italy), Masaryk University (MU, Czech Republic), the University of Paris Nanterre (UPN, France), and the University of Pécs (PTE, Hungary).

Establishing the European Student Card (ESC) within the alliance has been a priority **to facilitate access for students to infrastructures and services as well as to simplify students' mobility**. Within that perspective, EDUC partners built the EDUCardS project dedicated to experimenting with the implementation of the ESC. The project is coordinated by UR1 with the involvement of all EDUC members as full partners or associated partner (PTE). All six members are actively involved in the project regardless of their official status in the project. Therefore, this report will present the results of the experimentation conducted in all six EDUC member institutions.

The European Student Card Initiative is combining several Europe-wide projects – Erasmus Without Paper, Erasmus+ App, and the European Student Card. The objective of this initiative is twofold: (1) **Digitalising** student mobility administration processes to increase quality and enable more **mobilities** and (2) rolling out the "European Student Card" and enabling mobile students to gain **access to campus and other services**. The European Student Card (ESC) therefore aims at simplifying mobility for students and higher education institutions' processes by recognizing the students' status and identity. This recognition is carried out through a digital platform for data exchange called **European Student Card-Router** (ESC-R) by creating a unique **European Student Identifier** (ESI). The implementation of this initiative within European HEIs shall in the long run benefit the HEIs themselves and the students with a single-entry point for students (E+ App) and for mobility management.

Given this context, the EDUCardS consortium has established **three objectives to implement the ESC**: (1) to experiment with a **methodological framework** for implementing the European Student Card, (2) to **facilitate the use** of the card by students, (3) to **optimize and improve the use** of the European Student Card. To meet these objectives, EDUCardS partners were working on experimenting with the implementation of the ESC for the first two-and-a-half years of the project. Throughout the last year of the project, the partners have been collecting information and testimonials on the experimentation of the ESC within EDUC.

This report shares the challenges the EDUCardS-members faced, the successes managed and good practices identified, and provides ideas for improvements in the future. The document intends to support any HEI willing to implement the ESC or that is currently in the process of implementing the ESC. Experiences both as an alliance and as individual universities will be shared, as issues might lie on both levels.

I. State of the art: where did we start from?

1.1 Inventory of student cards' services, technologies, and manufacturing in the EDUCardS consortium

Student cards are primarily used by universities as a means for student identification and status verification. The student card is thus delivered to all students enrolled at all levels of higher education – bachelor, master and PhD levels, with an up-to-date status. The EDUC members account for **166,600 students** altogether. In the last years, all EDUC members have taken steps towards **multi-services cards** thanks to the progressive **digitalisation** of student cards – from plastic cards to magnetic cards, smart cards, contactless cards, etc.

- **Services offered in the local student cards**

The services available are based on each university's policy and local ecosystem (e.g. cultural services or public transports). The table below provides an overview of the services available at the different universities. All the information from the initial collection of services, our inventory of local student cards, is available in the Annex.

	EDUC HEI					
SERVICES	**UP**	**UR1**	**UNICA**	**MU**	**UPN**	**PTE**
Student Identification / status verification	✓	✓	✓	✓	✓	✓
Borrowing books from the library	✓	✓	✓	✓	✓	×
Access to university catering	✓	✓	×	✓	✓	×
Access to printing/copying facilities on campus	✓	✓	×	✓	✓	×
Building access	×	×	×	✓	×	×
Sport activities	✓	✓	✓	✓	✓	✓
Online payment (restaurants, cafeteria, vending machines…)	✓	×	×	✓	✓	×
Preferential public transports rates	✓	✓	×	✓	✓	✓
Discounts in cultural places (museums, cinemas, etc.)	✓	✓	✓	✓	✓	✓

Figure 1: Available services provided by student cards in EDUCardS consortium as of July 2022.

- **Heterogeneous levels and means of digitalisation**

As mentioned above, the increase in services offered on the student card is closely linked to digitalisation, especially to **the universities' information systems**. Most of the universities still have a physical card except UNICA, which has moved to a solely virtual card provided by an App[1] in 2020, with the beginning of the Covid19 pandemic. For the physical cards, the universities rely on either barcode with the card ID number or chip, or on visual reading. The

[1] Access to UNICA App for Android: https://play.google.com/store/apps/details?id=it.cineca.MyUniCA&hl=it&gl=US; Access to UNICA App for IOS: https://apps.apple.com/it/app/myunica/id446172114.

contactless technologies used by EDUCardS-institutions differ from one institution to another (examples of technologies: Desfire EV1, Mifare PlusX, EM4102, Calypso) and thus do not allow for the pooling of processes, i.e. the exchange of services, at this level.

When EDUCardS started, none of the consortium members used **QR control,** and the partners were not equipped to do so. However, the ESC builds on the use of the QR code as a compulsory main component. It is thus used, though the EDUCardS universities agree that the QR-code system might not guarantee an optimal level of security: Once the QR-code is flashed, only the student status appears indicating whether the student is enrolled or not. As a QR code is relatively easy to copy and photograph, forging a student card might be comparably easy. In contrast, the security level of a chip is higher, and it is in addition more difficult to forge, as it requires the manufacturing of a chip.

At the beginning of the project, only UPN was already registered on the ESC Router (ESC-R). All the other universities needed to register. In addition to the registration, the information system's connection is needed for data transmission and exchange. The EDUCardS universities referred to the technical documentation provided by the CNOUS in the framework of the ESC pilot project in order to understand the processes to be implemented for the ESC-R registration and data exchange.[2]

- **Card manufacturing management**

All student cards are issued by universities. However, the universities do not always have control over the production of the cards, as is also the case in the EDUCardS consortium. In Hungary, the student card is a notarial document that issued in a centralized process under national legislation. The university is only a contributor between the educational authority and the student. As for UR1, the production of cards is in the hands of a regional mixed economy company according to institutional agreements that constrain its visual and digital content. When it exists, the respective university's Card Management System (CMS) can be located either inside the institution or outside of it, with or without control over the manufacturing process. The CMS manages cards and associates them with individuals. It allows the integration of services (e.g. payment options, building access) and the management of the card's life cycle (e.g. accessibility of services per status group, de-activation, and re-activation).

- **Europeanisation / Internationalisation of the student cards**

When EDUCardS started in 2019, no services related to the European card system were provided by EDUC members, neither internally nor openly at the European level. However, MU and PTE already had integrated international cards.

MU has integrated the **ISIC** (International Student Identity Card) which is an internationally recognized student card that offers services (e.g. building access, canteen payment, computer lab access 24/7) and discounts (e.g. on public transport, bookshops, hotel accommodation, etc.). The ISIC card has been developed by the Global Youth & Student Community through

[2] HOW IT WORKS | European Student Card (last accessed on 22 July 2022).

a non-profit association (ISIC Association) since 1953 and is now issued to students in over 130 countries, resulting in about 5 million student users worldwide.

As for the **EYCA** (European Youth Card Association) implemented by PTE, it is a card distributed by 40 member organizations present in 38 countries across Europe, benefiting 6 million young people. It offers services, benefits and discounts. The Hungarian Ministry of Education has set up a partnership to ensure that all students receive EYCA cards.

The ISIC and EYCA cards mainly provide certain benefits (commercial partnerships) to students who own them. They are distributed by private organizations, and therefore **do not allow the exchange of data between higher education institutions.**

As for the European Student Card, the University of Nanterre (FR) already printed their student card with the components of the European Student Card by 2019, as mentioned above, but without providing any additional services based on the ESC initiative.

This introductory overview and inventory of students' cards services, technologies and manufacturing helped to identify the possible framework to experiment the implementation of the ESC.

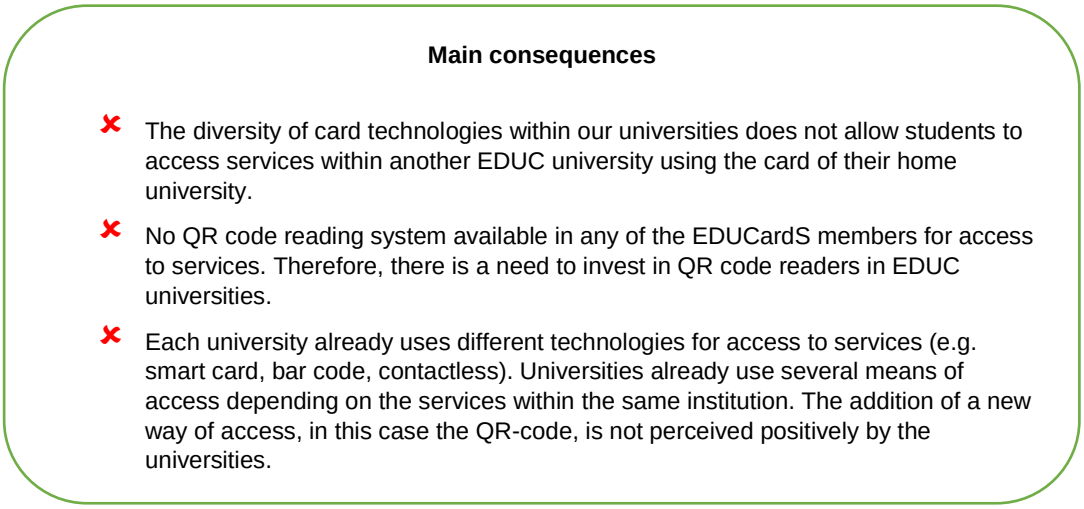

Figure 2: Main consequences of given infrastructure for ESC implementation.

1.2 Framework to experiment the implementation of the ESC within the EDUCardS consortium

Based on the mapping of the existing services, technologies, and manufacturing, the partner universities decided to focus on actions that could be carried out internally, without disrupting the manufacturing and distribution processes for student cards currently in place. Indeed, as described above, universities are not the only decision-makers and actors involved in those processes.

In addition, due to a heterogeneity of contactless technologies, universities can work on developing access to certain services that do not depend on card technology. Therefore, the experimentation needed to be carried out based on already existing tools, in particular the ESC-Router.

Three key orientations have emerged for the experimentation, which are being detailed and described in the methodological guide (O2)[3]:

- **Orientation 1 - Register on the ESC-R:**

The implementation of the ESC requires a connection between the institution's information system and the European digital data exchange platform "ESC-Router" (ESC-R), by creating a unique European identifier (ESI). This platform then hosts the data of each edited European Student Card. The university first needs to create an account with its institution-specific number – the PIC number. The administrator account is then validated by the national supervisor of the country where the university is located, except when there is no national supervisor, in which case the CNOUS validates the account (e.g. UP in Germany).

Once the university is registered on the ESC-R, it can generate and fill in the information for the creation of the ESC that are the ESI (European Student Identifier), the ESCN (the European Student Card Number), and the student's email address.

Other optional information can be stored, such as student name, date of birth, phone number and study level. There is a need here to also address relevant **GDPR** issues (i.e. agreement of the data protection delegate within the university, collection of student consent, information to be shared between universities, etc.).

The institutions are autonomous in their choice of technical solutions for generating and filling in the data. They also are autonomous in the choice on how to build the European Student Identifier (ESI) as long as it respects the nomenclature proposed by the ESC project and any nomenclature rules defined at local or national level.

- **Orientation 2 - Converting existing student cards into European cards:**

Once each institution is registered on the ESC-R, it can generate European student cards filling in the information mentioned above. The conversion of the cards currently in use at EDUC universities into European Student Cards can simply be achieved by adding a personalized QR code identifying the student and a standardised European hologram (at least when a physical card is generated, this is not necessary for an app-based student card).

For the hologram, this requires a high control on card making. Some rules also must be followed when it comes to its size, its place, and its orientation on the card even though each university can carry out the conversion independently, together with its card supplier. Additional costs must be considered for the hologram integration. Card suppliers need to order

[3]Available here: https://www.univ-rennes1.fr/sites/www.univ-rennes1.fr/files/medias/files/Guide%20to%20implement%20the%20ESC_V1.pdf.

holograms at the only one provider of holograms in Europe: the SELP company (https://www.selp.fr/en/home/).

- **Orientation 3 - Working on the development of services available on the ESC:**

EDUCardS members decided to focus the experimentation on a use case: the access to university library services. The aim of this case was to allow any EDUC student with a European Student Card to register at any of the EDUC universities' libraries to borrow a book or use services provided by the library (WIFI, printing, scanning, etc.). This implies identifying the students holding an ESC in addition to the already existing identification methods already used at university libraries.

II. Getting stakeholders involved in the experimentation

The involvement of stakeholders in the ESC initiative has been a main endeavour throughout the three-year project period and proved to be challenging, so that specific measures were taken and recommendations drafted that aim at providing a stepping stone in the further development of the initiative.

2.1 Drafting guides for staff and students

A **methodological guide (O2)** for staff members and institutions and one **practical guide for students (O3)** have been drafted to facilitate the implementation of the ESC within the EDUC consortium.

The methodological guide[4] introduces the ESC initiative. It raises awareness on the added value of the ESC both for students and staff members and therefore on how to get staff members engaged in the process. It also describes the different steps and aspects to be implemented related to the orientations defined above (ESC-R, ESC creation and services to be provided and to be explored).

The student guide is visual in format and based on what has been prepared by each local university. The communication strategy behind this choice relies on in-depth experience with international mobility that has shown that to effectively communicate with students, it is necessary to get straight to the point using an informal language together with quick visual checkpoints. The student guide has also been inspired by the ESC Youtube videos.[5]
The student guide provides general information on the EDUC Alliance including a map that shows the EDUC members and more detailed information on how the ESC will facilitate the

[4] https://www.univ-rennes1.fr/sites/www.univ-rennes1.fr/files/medias/files/Guide%20to%20implement%20the%20ESC_V1.pdf (last accessed 25 July 2022).
[5] https://www.youtube.com/watch?v=3w1aV27kY54 (last accessed 25 July 2022).

students' mobility and how it will give students access to specific services.

2.2 Stakeholders involved in the implementation of the ESC

While the overall coordination is ensured by UR1, the implementation of the ESC in each university is driven by the staff involved in the EDUCardS project, which are either project managers or IT staff. They had to get in touch and involve several university departments in different steps and aspects of the ESC as detailed in the table below:

Type of university service involved	Why do they need to be involved?
Internal services	
International Relation Office	For student mobility
Students Affairs department	For student registration and student card in some cases
IT Department	For ESC-R, data exchange, ESI, QR code and hologram
Top Management (Presidency, IRO Head of Department, IT Head of Department, etc.)	Governance of the ESC, structural organisation, mid-term and long-term vision of the student card
Communication Department	Communication toward students
Library Services	To implement new process allowing access to services thanks to ESC
External stakeholders	
Student Cards Printing Provider	For holograms
National Erasmus+ Agencies	For Erasmus+ Digital information and developments, participation to working groups
French National Agency for Student Services (CNOUS)	Institution in charge of developments of the ESC and ESC-R

Figure 3: Internal and external involvement for the ESC implementation.

2.3 Challenges to get the relevant stakeholders on board

It has been challenging to involve some of the stakeholders introduced above as there were several uncertainties regarding this pioneering project which is bringing about sizable organisational and technical changes for the student card creation and management:

University staff did not know much about the ESC Initiative and its benefits. Some were not sensitive to the European dimension and requirements of the European framework of cooperation. The difficulties to convince staff to dedicate some time to experiment the ESC in addition to their existing activities influenced the project and have to be taken into account for the planning of future roadmaps and timeframes. Indeed, no additional staff resources could be mobilised for implementing the experimentation. It remained therefore an additional workload that could not be regarded as a priority for the existing staff.

Moreover, the EDUCardS project is very hybrid in nature, meaning that it neither clearly falls into the realm of the EDUC alliance by way of integration into a concrete work package, nor

has the project been internally prioritised by the IT departments to develop the respective university's infrastructure – also because the institutions miss clarity in the EWP process. The missing formal organisational link to the EDUC Alliance and absence of a work package dedicated to experimenting with the ESC made it difficult to see as a priority within the alliance as well.

2.4 Momentarily limited interest of the students for the ESC – new perspectives

Based on the limited services provided at the moment, students showed low interest for the experimentation and the ESC in general as they could not receive many added benefits. Indeed, for students studying in another university for a semester or an academic year, it is hard to provide clear benefits of the ESC since they would receive a student card from the host university in any case, granting them the same rights as the regular students. For this student category (mobility for one semester or one year), it will only become interesting to get a ESC once it gives them access to the same services as the local host university card without the need to get the local card.

As for the short-term mobilities, they are relatively new formats of mobilities and are currently under development within the EDUC Alliance and at the European level in general (via the new Erasmus+ 2021-2027 and innovative mobilities within the European university alliances). Consequently, there is a permanent need to check what services are essential for short-term mobilities and then provide to the students holding an ESC access to those services. Seen this way, the ESC might then not provide the same level of services for all kinds of mobilities.

These considerations and re-evaluations are happening throughout the experimentation with the ESC and will continue beyond the EDUCardS project time. The continuation of the EDUC Alliance as well as the tasks addressed by the International Relations Offices and IT departments provide areas of further experimentation as the ESC and EWP processes pose new requirements and lie at the heart of added benefits for students.

III. Technical implementation of the ESC

Before moving from the stakeholders' involvement to the use case chosen to experiment within the EDUCardS consortium, the technical implementation and thus the basis for the experimentation will be detailed.

3.1 Registration on the ESC Router (ESC-R) and data transfer

The role of the ESC router (ESC-R) has already been mentioned above. This platform hosts the data of each edited European card (identity, number, country, etc). The technical

documentation concerning the parameterization of the APIs, the generation of the European card numbers (ESCN) or the generation of the QR codes are available on authenticated access. The registration of each institution on this platform[6] is essential: the API keys necessary for the Card Management System (or other system, e.g. identity management system; the specificity depends on the IT infrastructure of the university) to register information on the ESC-R are generated on the platform.

The creation of the facility requires the following information:

- Administrative name of the institution
- Country
- URL of its official website
- PIC code of the organization (this can be found or created here: https://ec.europa.eu/info/funding-tenders/opportunities/portal/screen/how-to-participate/participant-register)

The authorization of the administrator account(s) is done by a national supervisor for each country (unless there is no national supervisor, in which case the ESC-R provider (CNOUS) takes over). At the end of this procedure, each actor added to the platform receives an email containing a login and password. Access is then provided via the following URL:
https://router.europeanstudentcard.eu/login

The technical administrator (generally IT staff and the functional administrator, who is in most cases part of the International Affairs Department) can also register on the following webpage: https://edugain.europeanstudentcard.eu/. A **good practice** is to double these functions within each institution with **the registration of two technical and two functional administrators** so that the access always remains at the university.

As mentioned above, only UPN had registered on the ESC-R before the project started. All the other partners succeeded to register on the ESC-R at the beginning of the experimentation phase. The registration was then validated manually by a national supervisor or directly by the ESC-R provider (CNOUS).

The **transfer of data to the ESC-R** seems to have raised more challenges and difficulties for some universities that are, for some of them, still unsolved. While some universities have already automatized the transfer of data from their student management system to the ESC-R, some other universities still need to adapt their student or campus management system or internal workflows to develop a fully functional API that transfers the data as easily as possible. Depending on the IT infrastructure of the university, solutions must be found on a case-by-case basis.

3.2 Creation of the ESI

The ESI can be created in two different ways. First, it can be created directly on Edugain

[6] https://router.europeanstudentcard.eu/register

(https://edugain.org/) thanks to the process set up within MyAcademicID project[7] that enables a secure, single sign-on access to educational services. Second, a code can be generated from the router. This is an individualised process for each university.

Most of the universities have adopted the first option, the ESI being made of the national identifier of the student and integrated into the university information system, which communicates with the ESC-Router in an automatized way.

For the universities where this was not yet possible to implement, the second option was used even though they are willing to use Edugain in a mid-term perspective as a unified and standardized solution that allows to be used across multiple services and systems.

Knowledge of and control over the workflows of the different partner universities varies and depends on highly individual infrastructure and work processes, which include several services and levels of the universities. This means that the influence level is different for each partner and recommendations made throughout the EDUCardS project needed to address the strategic levels of the universities.

3.3 Generating the physical ESC: Integration of the hologram and of the QR code, design, and printing

All universities decided to experiment the implementation of the ESC on the physical card except UNICA, which did the experimentation with the virtual option, first via their own app and then via the Erasmus+ App.
PTE could not deliver any physical ESC since the national Hungarian regulations do not allow any change on the physical student card. UP has developed a timeframe to adapt their student card in the long-term in accordance with the experimentation within the EDUCardS project.

While it was possible for some universities (UPN, UR1, MU) to print the hologram and the QR code on physical card, the process however raised several issues:

The first main difficulty was that the student cards are most of the times manufactured by an organisation external to the university. It implied that discussions and negotiations were needed with those organisations to include the hologram and the QR code. In addition, in some cases, the card had to be re-designed in order to make all the necessary data and mandatory parts of both the local student card and of the ESC fit on a single card. For instance, the ISIC card at MU had to be printed on both sides to fulfil the ISIC requirements (logos, partner, photo, identification, validity & its extension etc.) and ESC requirements (QR code and hologram), which increased the costs of the student card manufacturing.

So far MU has produced 200 test cards, but only three students volunteered to test the usage of the card abroad. However, from 2022/2023, it has been decided that all newly accepted students to MU will be given ESC-ready ISIC cards. This has been a huge step in the case of

[7] https://myacademic-id.eu/ (last accessed 26 July 2022).

Masaryk University and for the incoming students as the university infrastructure is completely based on chip technology.

Most of the times, the adaptation of the card as ESC also raised costs of the student card delivery. In the case of UR1, holograms were ordered by the student card provider to the SELP company. UR1 usually made a common order of student cards with several HEIs in Rennes to reduce the cost. As UR1 planned to integrate the hologram, it was not part of the joint order, which increased the price (integration of hologram and fewer number of cards).

The adaptation also required in some cases some technical adaptations or adjustments. For instance, it was not possible to automatise the process at UR1 for the personalised QR code integration on the cards. The IT department developed an application to gather the QR code issued by the ESC-Router on the one side and the student information issued by the student management system on the other side. The application not being “user friendly” was also an issue, as the student office that usually prints information on the card could not use it. This is why the IT department at UR1 produced the student cards for mobility students only. Those cards (see figures 4 and 5) were then printed by the student offices and afterwards sent to the mobility students. Via this process, 330 students received – in addition to their regular student card – a European Student Card, including the QR code. Although imperfect, this solution allowed UR1 and the EDUCardS consortium to test the issuing process of the ESC. Below you will find a sample of an ESC created at UR1:

Figure 4: Front of the UR1 Student card including the ESC hologram.

Figure 5: Back of the UR1 student card including the ESC QR Code.

3.4 Moving toward a single virtual ESC on the Erasmus+ App?

While the production and delivery of the physical cards raised many issues – such as their production being time consuming, increasing costs, citing technical and design issues – the virtual ESC based on the Erasmus+ App, once fully developed, seems to be a simpler, cheaper, and less time-consuming way of creating an ESC.

The app-based solution has been experimented with by UNICA, which decided to move from their physical student card to an app because of the Covid19 pandemic, as student offices had to close for an extended period of time. On a technical and distributary level, no major issues were met. There was no problem generating the QR code and no need for a hologram as it was a virtual card.

The process for creating the card is as follows: The student creates an account on the Erasmus+ App with the identifiers of his/her home university, which are provided thanks to the eduGAIN system. The student then fills in some information, including the Erasmus program they are participating in.
The digital ESC is currently officially available for participants in the following Erasmus+ programs: Study Mobility in Higher Education, Internship Mobility, Erasmus Mundus. In order to access their ESC, students must choose one of these programs in their profile after logging in on the Erasmus+ App.

To generate a digital European student card in the Erasmus+ App, two conditions must be met at this time:

- that the student uses eduGAIN, which allows them to log in with their own user account and password from their respective university,
- and that the university uses the ESI as part of the university attributes published in its eduGAIN mechanism.

If all of the above conditions are met, a student can generate a European Digital Student Identity Card. If not, the student does not have access to their digital ESC.

Each student card has an ESC number printed in the form of a QR code. As far as the Erasmus+ App is concerned, it is worth mentioning that at the moment the connection with the ESC router is not realized. A student can therefore have two different ESCs (the physical and the virtual one), which might cause confusion about the modalities and uses of the ESC. Also, the requirements in the Erasmus+ app differ from the ESC requirements (based on the ESC-Router, depth of services). These are challenges for the European Commission and the consortia in charge of decisions related to the ESC and its implementation.

Through the Erasmus+ application, institutions can read the data through the QR-code. The personal information sent to the secure platform of the European Student Card are the student's email address, the ESI (European Student Identifier) and the academic level. This makes identifying the student and verifying their status quick and simple. GDPR consent is handled by the app.

Below you will find an example of a virtual ESC at UNICA:

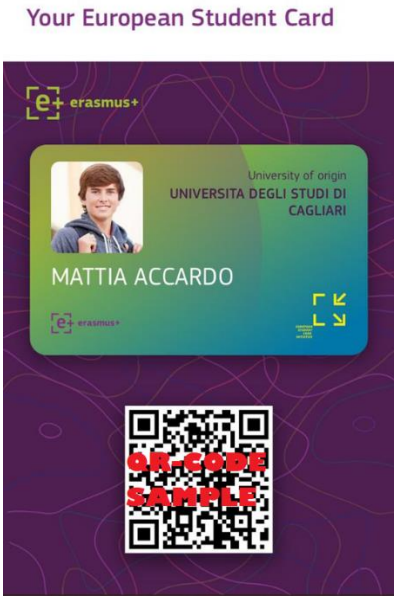

Figure 6: Virtual ESC example from UNICA.

However, generating ESCs with the Erasmus+ App does not allow universities to access data on how many cards have been created.

The EDUCardS consortium hopes that, if the ESC-R and Erasmus+ App would be interoperable, there would be at the same time

- a single-entry point for students in Erasmus+ mobilities to manage their data and for the IOs to store and exchange information regarding mobilities,
- a safe and secure way to generate ESCs and check student status,
- a means for universities to keep an overview on the creation of their ESCs.

IV – The ESC to facilitate access to services: the library use case

4.1 The choice of the library use case

For the concrete experimentation, the EDUCardS consortium decided to make the access to services of the library their focus. This was agreed upon in order to put efforts in one place and not to overload the project and the staff's resources.
Libraries are an essential place for all students, including those on short, mid-term and long-term mobility programmes. Facilitating the access to the libraries for European exchange students appeared to be the evident use case within the framework of this project.

The library use case remains relevant within the further development of the EDUC alliance activities: From 2022 onward, a task will be dedicated to open EDUC infrastructures and data for education (Task 2.2 in the EDUC full rollout project). The need for EDUC's libraries to connect and agree on common standards and procedures with regards to openness and licensing has been voiced in different work package contexts, during the EDUCardS staff week in June 2022 in Rennes, and is, as discussed during the staff week, also a need within other European Universities Alliances.

However relevant, EDUCardS members quickly became aware of the heterogeneous nature of the library services within their alliance. Libraries services vary from one university to another: At the Universities of Potsdam and Masaryk, e.g., the access to the university library is open to the public in general, with no registration being required to work within the library. This applies also to UR1, with certain hours and spots being reserved to students and researchers.
Access to university resources from outside the library, the usage of services such as borrowing books, printing and scanning, vary within the consortium and depend on the status (in this case student status) of the respective user.

4.2 Heterogeneous levels of experimentation

The experimentation and exchanges on adaptation of services could happen in six out of the six EDUCardS universities, however in different quality. The table below summarizes what obstacles were met for the experimentation, what were the successes and the adaptations needed:

	Could the experimentation take place?	Obstacle(s) to the experimentation	Success(es)	Adaptation needed
UP	✘ (Starting in autumn 2022)	- Gap in project management - Unclarity of additional workload made library initially hesitant, no benefit of QR-code scanning for library	Openess for all EDUC mobility students from September 2022 with limited service; to be rendered accessible via IO confirmation	- No QR-readers - Residency confirmation to be provided by IO
UR1	✓	- No QR code reader - No added value of QR code reader from Library point of view - Different levels of services available depending on the mobility scheme	All students from EDUC can access UR1 library services for free by providing its home student card	- No QR code technology implemented - Add EDUC universities on the list of partners whose members do not need to pay and can access the library services - Bar code added to student cards to borrow books
UNICA	✓	None, the experimentation went well	Integration of the ESC into Student Management System and Library Management System	Purchase of a mobile devise for ESC QR code check
MU	✘	Readers' infrastructure and identity management not	Basic services of the library available to non-	No adaptation implemented for the experimentation

		compatible with the QR code reader with ESCN recognition	MU card holders (Czech law). No need for EDUC students to hold an ESC card to access basic services.	
UPN	✓	The student registration system (APOGEE) does not allow the University of Nanterre to implement the ESC in a concrete way with more than library access. A restructuring of the system is necessary and the staff involved in the project at the moment is insufficient.	Access to library for mobility students	No adaptation implemented for the experimentation
PTE	✓	No possibility to borrow book with an ESC card, there is a need to register as a regular user	Possibility to get a free daily pass to access the library after scanning the ESC card with a tablet	Provision of a tablet computer

Figure 7: Library experimentation and adaptations.

Generally speaking, libraries have already taken steps toward becoming as open as possible to students and the public based on institutional or national frameworks. However, the experimentation showed that the depth of services provided varies and that harmonising the offer for all European students still needs further development.

With regards to an evaluation interest, it is unfortunate that it was not possible to check how many students used the ESC in libraries, as there is no centralised basic data collection.

4.3 Integrating new services?

The limited duration, human resources and framework of the project did not allow to explore other services than libraries to be included on the ESC. However, within the EDUCardS consortium, some additional services are already available with the ESC:

UNICA added a new service to the ESC card: a free entrance to the botanical garden directed by UNICA. UR1 made the university restaurants (CROUS) accessible to ESC holders with a student rate even though continuous communication toward restaurant staff is still necessary, as some of them are not aware of this discount available for ESC holders.

As mentioned in section II.4, the level of services depends on the kind of mobility pursued. For a **semester and academic year**, the host card given out for such periods of mobility, grants access to the same services regular students can access. It would then be relevant to explore on a bigger scale how these mobility students can access the same level of services than regular students only with the card from their home university converted into an ESC.

As for **short-term mobility** schemes, it would be relevant to agree on a **list of services** that are **of essential use** (e.g. we would recommend including the access to infrastructure such as libraries, canteens, and cafeterias).

This also raises the issue of the interoperability between the **ESC and payment systems** for the canteen, cafeteria, access to printing facilities, etc., a topic that requires adaptions that need to be addressed continuously in the coming years. Regional and local ecosystem services prove to be difficult to be included in the ESC as separate contractual commitments exist that need to be addressed on a strategic level.

Conclusion and recommendations

The report on the experimentation with the ESC hints at several occasions to the strategic and EU-level, which need to be actively involved in shaping the future ESC and use of the Erasmus+ App. However limited, the EDUCardS experimentation phase has allowed the consortium to identify challenges and to formulate recommendations for the future development and implementation of the initiative.

A challenging experimentation

Experimenting the implementation of the ESC for EDUC partners has been challenging at several levels, which can be summarised as follows:

- **Involving** the relevant stakeholders and **raising awareness** of the ESC Initiative as well as **engaging** the interest of students and convincing them of the added value and of the benefits of the ESC in an experimentation phase
- **Heterogeneity** of student **cards** in EDUC universities (technology, manufacturing, etc.), of EDUC **infrastructures** (e.g., for the libraries, different levels of services), national regulations, local and regional constraints
- Ensuring **connectivity** and **interoperability** between digital tools and technology with a required level of security
- Define **different levels of services** for the ESC holders: **short-term** mobilities on one hand and **semester/ academic year** mobility one the other hand with the access to the same services as regular students from the host institution

The challenges have been detailed in the previous sections of the report in order to provide a ground for the future development of the initiative and cooperation regarding mobilities and shared infrastructures.

From our experimentation with the ESC, we derive the following recommendations:

Recommendations

- The ESC is a topic that needs to be fully addressed by the EDUC and other European University Alliances in the coming years. In order to be able to do so, the alliances require adequate attention, human resources, dedicated units supporting them, and time.
    - In our case, the topic relates to the issue of access **to the respective university's infrastructures** to other members of the EDUC alliance that shall be tackled in the Tasks 1.3., 2.1, and 2.2. of the EDUC full roll-out, in dialogue with the EU policy level.

- The **level of access to services and infrastructure** according to the type of mobility (short-term, semester, academic year) should be decided at the EDUC alliance level to decide on the services that shall be available on the ESC.

- An **inter-alliance dialogue** shall be continued on the ESC to identify best practices, facilitate its implementation, and adopt convergent practices.

- Moving towards a **virtual-only ESC** that relies on the interoperability of Erasmus+ App and ESC-R to have a single point of entry for mobility students, and to have a homogeneous GDPR management. Our recommendation is to provide access to the Erasmus+ App to all mobility students, whether they are part of an Erasmus programme or not.

- Rely on **safe and secure technologies** such as NFC (near field communication) or chip based technology.

On the EDUC alliance level it will be important to include the two new EDUC members (USN and UJI) – we hope that this report will provide an onboarding document for them.
We hope the report provides likewise a useful starting point for institutions outside our alliance aiming at implementing the ESC as some of our successes and good practices identified might provide useful starting points.
Any HEI willing to implement the ESC or that is currently in the process of implementing the ESC is invited to contact our alliance at educ-alliance@uni-potsdam.de.

Annex

Inventory of existing student card - April 2020

Inventory	Type of card	Card editing	Delivery of the card	Use of the card	ESC card	Student information on the card	Other information on the card	Technologies used	Services provided
Cagliari	Plastic (PVC), credit card size 85,6x54 mm	University of Cagliari	At the University (student office)	Identification (university area), access to services	NO	Photo, name, date of birth, place of birth, student regitration number	Card number,date of issue, course of study	Magnetic band (unused)	The card is used for identification in the university area, included library. Some discount on selected shops and museums.
Masaryk	Plastic (PVC), credit card size 85,6x54 mm	Required ISIC elements, otherwise MUNI	At the University (registrar's office)	Identification, access to services	NO	Photo, name, date of birth	Title and ID number of the card, name of HEI, card validity date, sticker of validity extension, ISIC logo, barcode (card ID number), student halls of residence identification sticker	contactless chip (EM4102, 125 KHz readonly), barcode (card ID number)	Chip: - access points (doors, barriers, turnstiles, clothes closets, parking) - library (borrowing books, selfcheck boxes) - identification (study and HR officer) - internal billing system (print, scan, copy, credit top-up machine, drinks and refreshment dispensers, catering, laundromats) Barcode - library backup in case of chip malfunction - identification (study, HR) in case of chip malfunction ISIC discounts including public transport discounts (ISIC logo + validity sticker)
Nanterre	Plastic	UPN?	At registration by the registration office	Identification, access to services	YES in 2019	Photo, name, date of birth, UPN student ID, National Student ID	Title of the card, academic year, study program, UPN's FR / PIC code, ESC hologram, ESC QR-code, logos: UPN, Crous, Izly, UPL, Campus Condorcet, image, barcode	Chip (encoding standard Desfire EV1?), QR-code, Barcode	Payment of catering and photocopies (chip), borrow books from the library (barcode)
Pécs	Plastic (PVC), credit card size 85,6x54 mm	Education Authority of Hungary	At the University (registrar's office)	Identification, access to services	NO	Photo, name, date of birth, place of birth,signature, National Student ID, address of student	Title of the card, ID number of the card, Issuing authority, date of issue, year of final validation, name of HEI, NEK logo (NEK stands for National Unified Card System), validation sticker for each semester, EYCA logo, barcode	contact-free Mifare PlusX 4K chip, barcode containing the card ID number	The card is only used for identification and through that to access services: generally speaking 50% discount on public transportation in Hungary, library fees and museums. There are around 1000 other shops and companies in Hungary who provide discount between 5-30%. As the card has the EYCA logo, users are eligible for a lot of other international discounts: https://www.eyca.org/discounts
Potsdam	Plastic	University of Potsdam	At registration by the registration office	Identification, access to services, e-payment	No	Visible information: Photo, student name, university student ID nr. , card nr., enrollment status (per semester), semester ticket validation for public transport	Information on RFID-Chip: card serial nr., university student ID, library ID nr., university number, personal pin, e-payment function: amount of credit on card	contactless RFID chip, heat printing for actualising changing visible information on the card (enrolment status and public transport access) each semester	Student ID with security features as the owner's proof of identity Semester ticket Library card Copy and print card electronic wallet for small amounts to make payments in dining halls, cafeterias, and libraries
Rennes (fully distributed)	Plastic and paper	Université de Rennes 1	At the University or sent by mail	Identification (student status)	No	College year, photo, name, date of birth, place of birth, signature, National Student ID, Information system student ID, university sector	University address, university web site, general manager's signature	None	
Rennes (not yet fully distributed)	Plastic	Rennes Métropole (local governement)	At the agency or sent by mail	Access to services	No	Photo, name	CSN of the card, traveler's ID	Electronic : - RFID (ISO 14443-B) - chip	Borrow books from the library, sport activities (RFID)