ENHANCE
European Universities of Technology Alliance

WP3	
D 3.16	**Modular training toolkit for students engaged in ENHANCE activities.**

Date: January 2022	Type: Report	Dissemination: Public	Lead: WUT
			Authors:
			Piotr Pałka
			Andrzej Kraśniewski

CONTENTS

Modular training toolkit for students engaged in ENHANCE activities
Executive summary

We propose the concept of a toolkit intended for students interested in engaging in ENHANCE activities. We present ideas, tips, and advice for organising processes that involve students in co-creating activities associated primarily with teaching and learning and with research to a lesser extent. We show examples of such activities currently taking place at the ENHANCE universities.

We believe that the toolkit will assist students in learning about ample opportunities of engaging in ENHANCE activities and in organising events aimed at increasing the participation of their colleagues in co-creation processes. We advise students on how to most effectively engage in such processes and thereby motivate and empower them as co-creators of education and research taking place at the ENHANCE universities. Although the toolkit is intended primarily for students, academic staff can also find it a useful source of information and inspiration.

The report has two parts.

The first part gives a brief review of the relevant literature on the participation of students in various forms of co-creation activities taking place at universities. Several types of engagement and the different roles of students in co-creation processes are discussed. As an example, the "ladder of student participation in curriculum design" shows how student engagement in the development of a curriculum can evolve from essentially no interaction, through having some choice and control of prescribed areas to having a substantial influence on all decision-making processes regarding the curriculum.

Other aspects of students' involvement in the development of a curriculum or its part – a course or a module – are also discussed, including:

- different approaches regarding the number of students participating in co-creation (a small selection of students vs. all the students participating in the co-creation process),
- different approaches to co-creation (co-creation of the curriculum – before the programme or course takes place vs. co-creation in the curriculum – co-design of learning and teaching within a course or programme, usually during the course or programme).

The large spectrum of possible outcomes of the co-creation processes reported in the literature is presented as well.

In the second part of the report, we focus on six selected types of co-creation processes taking place at universities, namely:

- co-creating of events and workshops by students,
- co-researching and undertaking scholarship projects by students supported by staff,
- students' participation in course and curriculum design review committees,
- co-assessing by students,
- co-designing courses and curricula by students,
- co-evaluation of courses by students.

These six types of co-creation activity correspond to six modules in our toolkit.

For each module, the following issues are discussed:

- encouraging students: What are potential incentives for a student to participate in co-creation activities? How to encourage students to get involved in co-creation of university activities? What can discourage students from participating in the co-creation process?
- costs and benefits: Do we need the co-creation at university? What are the costs (not necessarily monetary) of co-creation? What are the benefits (for whom) of co-creation?
- organisation: How to organise the co-creation process engaging a small group of students/the whole class?

Then, examples of co-creation activities taking place at the ENHANCE universities are presented to show possible directions and inspire future developments. Finally, for each module, a scenario is proposed to advise the students on how to engage in each type of co-creation process effectively.

The basic concepts presented in the report, related to six identified aspects of university activity where co-creation could be particularly beneficial, were initially discussed at meetings of the Higher Education Innovator working group. The proposed recommendations are based on the outcomes of the "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised by the Warsaw University of Technology on 5 November 2021. The workshop was conducted online using WebEx and Miro and attended by 13 representatives of 6 ENHANCE universities: students, academics, and members of administrative staff:
https://workshop.enhance.pw.edu.pl/toolkitstudentscocreation

Modulares Schulungs-Toolkit für Studierende, die an ENHANCE Aktivitäten teilnehmen
Kurzdarstellung

Wir schlagen das Konzept eines Toolkits vor, das sich an Studierende richtet, die sich an ENHANCE-Aktivitäten beteiligen möchten. Wir präsentieren hier Ideen, Tipps und Ratschläge für die Organisation von Prozessen, die Studierende in die Mitgestaltung von Aktivitäten einbeziehen, die in erster Linie mit Lehren und Lernen und in geringerem Maße mit Forschung zu tun haben. Wir zeigen Beispiele für solche Aktivitäten, die derzeit an den ENHANCE-Universitäten bestehen.

Wir sind der Überzeugung, dass das Toolkit den Studierenden dabei hilft, sich über die zahlreichen Möglichkeiten der Beteiligung an ENHANCE-Aktivitäten zu informieren und Veranstaltungen zu organisieren, die darauf abzielen, die Beteiligung ihrer Kommiliton*innen an Co-Creation-Prozessen zu erhöhen. Wir beraten die Studierenden, wie sie sich am effektivsten in solche Prozesse einbringen können, um sie dadurch als Mitgestalter von Bildung und Forschung an den ENHANCE-Universitäten zu motivieren und zu befähigen. Obwohl sich das Toolkit in erster Linie an Studierende richtet, kann es auch für akademisches Personal eine nützliche Informations- und Inspirationsquelle sein.

Der Bericht besteht aus zwei Teilen.

Der erste Teil gibt einen kurzen Überblick über die einschlägige Literatur zur Beteiligung von Studierenden an verschiedenen Formen von Co-Creation-Aktivitäten, die an Hochschulen stattfinden. Es werden verschiedene Arten des Engagements und die unterschiedlichen Rollen der Studierenden in Co-Creation-Prozessen diskutiert. Als Beispiel zeigt die "Leiter der studentischen Beteiligung an der Lehrplangestaltung", wie sich die Beteiligung der Studierenden an der Entwicklung eines Lehrplans von im Wesentlichen keiner Interaktion über eine gewisse Wahlmöglichkeit und Kontrolle über vorgegebene Bereiche bis hin zu einem wesentlichen Einfluss auf alle Entscheidungsprozesse in Bezug auf den Lehrplan entwickeln kann.

Andere Aspekte der Beteiligung von Studierenden an der Entwicklung eines Curriculums oder eines Teils davon - eines Kurses oder eines Moduls - werden ebenfalls erörtert, darunter:

- unterschiedliche Ansätze in Bezug auf die Anzahl der an der Co-Creation beteiligten Studierenden (eine kleine Auswahl von Studierenden vs. alle am Co-Creation-Prozess beteiligten Studierenden),

- unterschiedliche Ansätze der Mitgestaltung (Mitgestaltung des Curriculums - bevor das Programm oder der Kurs stattfindet vs. Mitgestaltung im Curriculum - Mitgestaltung des Lernens und Lehrens innerhalb eines Kurses oder Programms, normalerweise während des Kurses oder Programms).

Das breite Spektrum möglicher Ergebnisse der in der Literatur beschriebenen Co-Creation-Prozesse wird ebenfalls vorgestellt.

Im zweiten Teil des Berichts konzentrieren wir uns auf folgende sechs ausgewählte Arten von Co-Creation-Prozessen, die an Hochschulen stattfinden:

- Mitgestaltung von Veranstaltungen und Workshops durch Studierende,
- gemeinsame Forschung und Durchführung von Stipendienprojekten durch Studierende mit Unterstützung von Lehrkräften,
- die Beteiligung von Studierenden an Ausschüssen zur Überprüfung von Studiengängen und Lehrplänen,
- Mitbewertung durch Studierende,
- Mitgestaltung von Kursen und Lehrplänen durch Studierende,

- Ko-Evaluierung von Lehrveranstaltungen durch Studierende.

Diese sechs Arten von Mitgestaltungsaktivitäten entsprechen den sechs Modulen in unserem Toolkit.

Für jedes Modul werden die folgenden Themen erörtert:

- Ermutigung von Studierenden: Was sind mögliche Anreize für Studierende, sich an Co-Creation-Aktivitäten zu beteiligen? Wie können Studierende ermutigt werden, sich an der Mitgestaltung von Hochschulaktivitäten zu beteiligen? Was kann Studierende davon abhalten, sich am Co-Creation-Prozess zu beteiligen?
- Kosten und Nutzen: Brauchen wir Co-Creation an der Universität? Was sind die (nicht unbedingt finanziellen) Kosten der Ko-Kreation? Was sind die Vorteile (für wen) von Co-Creation?
- Organisation: Wie kann der Co-Creation-Prozess mit einer kleinen Gruppe von Studierenden/dem ganzen Kurs organisiert werden?

Anschließend werden Beispiele für Co-Creation-Aktivitäten an den ENHANCE-Hochschulen vorgestellt, um mögliche Richtungen aufzuzeigen und künftige Entwicklungen zu inspirieren. Schließlich wird für jedes Modul ein Szenario vorgeschlagen, um Studierende zu informieren, wie sie sich in einer bestimmten Art von Co-Creation-Prozess effektiv engagieren können.

Die in dem Bericht vorgestellten grundlegenden Konzepte, die sich auf sechs identifizierte Aspekte der universitären Tätigkeit beziehen, bei denen die Ko-Kreation besonders vorteilhaft sein könnte, wurden zunächst in Treffen der Arbeitsgruppe "Higher Education Innovator" erörtert. Die vorgeschlagenen Empfehlungen basieren auf den Ergebnissen des "Workshops für ein modulares Schulungs-Toolkit für Studierende, die an ENHANCE-Aktivitäten teilnehmen", der am 5. November 2021 von der Technischen Universität Warschau organisiert wurde. Der Workshop wurde online über WebEx und unter Nutzung von Miro durchgeführt. Es nahmen 13 Vertreter*innen von 6 ENHANCE-Hochschulen teil: Studierende, Wissenschaftler*innen und Verwaltungsmitarbeitende (https://workshop.enhance.pw.edu.pl/toolkitstudentscocreation).

Toolkit di formazione modulare per gli studenti impegnati nelle attività di ENHANCE
Executive summary

Proponiamo il concetto di un toolkit destinato agli studenti che vogliono partecipare alle attività di ENHANCE. Presentiamo idee, suggerimenti e consigli per organizzare processi che coinvolgano gli studenti in attività di co-creazione associate principalmente all'insegnamento e all'apprendimento e, in misura minore, alla ricerca. Mostriamo esempi di tali attività attualmente in corso nelle università ENHANCE.

Crediamo che il toolkit aiuterà gli studenti a conoscere le ampie opportunità di impegnarsi in attività ENHANCE e a organizzare eventi volti ad aumentare la partecipazione dei loro colleghi nei processi di co-creazione. Consigliamo agli studenti come impegnarsi nel modo più efficace in questi processi e pertanto li motiviamo e li rendiamo co-creatori dell'istruzione e della ricerca che si svolgono nelle università ENHANCE. Anche se il toolkit è destinato principalmente agli studenti, anche il personale accademico può trovarlo un'utile fonte di informazioni e ispirazione.

Il report si compone di due sezioni.

La prima fornisce una breve rassegna della letteratura rilevante sulla partecipazione degli studenti in varie forme di attività di co-creazione che si svolgono nelle università. Vengono discussi i diversi tipi di impegno e i diversi ruoli degli studenti nei processi di co-creazione. A titolo di esempio, la "scala della partecipazione degli studenti nella progettazione del curriculum" mostra come l'impegno degli studenti nello sviluppo di un curriculum può evolvere da essenzialmente nessuna interazione, attraverso una certa scelta e controllo delle aree prescritte fino ad avere una sostanziale influenza su tutti i processi decisionali riguardanti il curriculum.

Vengono discussi anche altri aspetti del coinvolgimento degli studenti nello sviluppo di un curriculum o di una sua parte - un corso o un modulo - tra cui:

- diversi approcci riguardo al numero di studenti che partecipano alla co-creazione (una piccola selezione di studenti vs. tutti gli studenti che partecipano al processo di co-creazione),
- diversi approcci alla co-creazione (co-creazione del curriculum - prima che il programma o il corso abbia luogo vs. co-creazione nel curriculum - co-progettazione di apprendimento e insegnamento all'interno di un corso o programma, di solito durante il corso o programma).

Viene presentato anche l'ampio spettro di possibili risultati dei processi di co-creazione riportati in letteratura.

Nella seconda sezione del rapporto ci concentriamo su sei tipi di processi di co-creazione selezionati che hanno luogo nelle università, vale a dire:

- co-creazione di eventi e laboratori da parte degli studenti,
- co-ricerca e realizzazione di progetti di borse di studio da parte di studenti con il supporto del personale,
- partecipazione degli studenti ai comitati di revisione dei corsi e dei curricola,
- co-valutazione da parte degli studenti,
- co-progettazione di corsi e curricula da parte degli studenti,
- co-valutazione dei corsi da parte degli studenti.

Questi sei tipi di attività di co-creazione corrispondono a sei moduli del nostro toolkit.

Per ogni modulo, vengono discusse le seguenti questioni:

- incoraggiare gli studenti: Quali sono i potenziali incentivi per uno studente a partecipare ad attività di co-creazione? Come incoraggiare gli studenti a essere coinvolti nella co-creazione di attività universitarie? Cosa può scoraggiare gli studenti dal partecipare al processo di co-creazione?
- costi e benefici: Abbiamo bisogno della co-creazione nell'università? Quali sono i costi (non necessariamente monetari) della co-creazione? Quali sono i benefici (e per chi) della co-creazione?
- organizzazione: Come organizzare il processo di co-creazione coinvolgendo un piccolo gruppo di studenti o l'intera classe?

Vengono inoltre presentati esempi di attività di co-creazione che hanno luogo nelle università ENHANCE per mostrare le possibili direzioni e ispirare gli sviluppi futuri. Infine, per ogni modulo, viene proposto uno scenario per consigliare agli studenti come impegnarsi efficacemente in un determinato tipo di processo di co-creazione.

I concetti di base presentati nel rapporto, relativi a sei aspetti identificati dell'attività universitaria in cui la co-creazione potrebbe essere particolarmente vantaggiosa, sono stati inizialmente discussi nelle riunioni del gruppo di lavoro Higher Education Innovator. Le raccomandazioni proposte si basano sui risultati del "Workshop per il toolkit di formazione modulare per gli studenti impegnati in attività ENHANCE" organizzato dall'Università di Tecnologia di Varsavia il 5 novembre 2021. Il workshop è stato condotto online utilizzando WebEx e Miro e hanno partecipato 13 rappresentanti di 6 università ENHANCE: studenti, accademici e membri del personale amministrativo (https://workshop.enhance.pw.edu.pl/toolkitstudentscocreation).

Modulbasert læringsverktøysett for studenter som engasjerer seg i ENHANCE-aktiviteter

Sammendrag

Vi vil her legge fram konseptet med et verktøysett beregnet på studenter som er interessert i å delta i ENHANCE-aktiviteter. Vi presenterer ideer, tips og råd for å organisere prosesser som involverer studenter i samskapingsaktiviteter, primært knyttet til undervisning og læring, og til en viss grad forskning. Vi vil vise eksempler på slike aktiviteter som pr.idag foregår ved ENHANCE-universitetene.

Vi tror at et slikt verktøysett vil hjelpe studentene både med å få innsikt i de mange mulighetene som finnes for å engasjere seg i ENHANCE-aktiviteter og med å organisere arrangementer rettet mot økt studentdeltagelse i samskapingsprosesser. Vi gir studentene råd om hvordan de mest effektivt kan delta i slike prosesser for å dermed motivere og styrke dem som medskapere av den utdanning og forskning som finnes på ENHANCE-universitetene.

Verktøysettet er primært beregnet på studenter, men vitenskapelig ansatte kan også bruke det som en nyttig kilde til informasjon og inspirasjon.

Rapporten er todelt.

Første del gir en kort gjennomgang av relevant litteratur om studentdeltagelse i ulike samskapingsaktiviteter som finnes på universiteter. Flere ulike former for engasjement og de mulige rollene studenter kan inneha i samskapingsprosesser blir diskutert. Et eksempel er «stigen til studentmedvirkning i læreplanutforming», som viser hvordan studentenes engasjement i utviklingen av en læreplan kan gå fra så godt som ingen interaksjon, gjennom å ha noen valgmuligheter og kontroll over enkelte områder til å ha betydelig innflytelse på alle beslutningsprosesser som angår pensum/læreplan.

Andre aspekter ved studentinvolvering når det gjelder utvikling av hele eller deler av læreplanen (som f.eks. et enkeltkurs), blir også diskutert, bl.a.:

- Ulike tilnærminger til antall studenter som tar del i samskaping (et lite utvalg studenter vs. alle)
- Ulike tilnærminger til samskaping (samskaping av læreplanen før faget/ kurset starter vs. samskaping av undervisning/ læring innenfor et fag/kurs underveis).

Det store spekteret av mulige utfall av samskapingsprosessene rapportert i litteraturen presenteres også.

I den andre delen av rapporten fokuserer vi på seks utvalgte varianter av samskapingsprosesser på universiteter:

- Samskaping av studentdrevne arrangementer og workshops
- Samskaping i studentdrevne forsknings-og stipendprosjekter, støttet av universitetsansatte.
- Studentdeltagelse i komiteer for gjennomgang av pensum
- Samvurderinger utført av studenter
- Samdesign av kurs og pensum, utført av studenter
- Samevaluering av fag/kurs, utført av studenter

Disse seks variantene korresponderer til seks moduler i vår verktøykasse.

Følgende problemstillinger diskuteres i hver modul:

- Oppmuntre studenter: Hva kan være mulige intensiver for å få en student til å delta i samskapingsaktiviteter? Hvordan oppmuntre studenter til å involvere seg i samskaping av

universitetsaktiviteter? Hva kan være til hinder for studentdeltagelse i samskapingsprosesser?

- Kostnader og fordeler: Trenger vi samskaping på universitetet? Hvilke kostnader (ikke nødvendigvis økonomiske) medfører slike samskapingsprosesser? Hva er fordelene med samskaping og hvem vil dra nytte av disse fordelene?
- Organisering: Hvordan skal samskapingsprosessen organiseres slik at den engasjerer enten en liten studentgruppe eller hele klassen?

Deretter presenteres eksempler på samskapingsaktviteter som eksisterer ved ENHANCE-universitetene for å vise mulige fremgangsmåter og inspirere fremtidig utvikling. Til slutt blir det for hver modul foreslått et scenario for å gi studentene råd om hvordan de kan effektivt engasjere seg i en samskapingsprosess.

De grunnleggende konseptene som presenteres i rapporten er knyttet til seks aspekter ved universitetsaktiviteter som er identifisert som områder der samskaping kan være av stor nytte, og disse ble først diskutert på møter i arbeidsgruppa *Higher Education Innovator.* De foreslåtte anbefalingene er basert på resultatene fra arbeidet i en workshop titulert «Workshop for modul-baserte opplæringsverktøysett for studenter engasjert i ENHANCE-aktiviteter», som ble organisert av TU Warszawa 5.november 2021. Workshopen ble gjennomført digitalt ved hjelp av plattformene WebEx og Miro, og 13 representanter fra 6 ENHANCE-universiteter deltok: studenter samt både akademisk og administrativt ansatte.

(https://workshop.enhance.pw.edu.pl/toolkitstudentscocreation).

Modułowy zestaw narzędzi dla studentów zaangażowanych w działania ENHANCE

Streszczenie

Dokument przedstawia koncepcję zestawu narzędzi przeznaczonego dla studentów zainteresowanych zaangażowaniem się w działania prowadzone w ramach konsorcjum ENHANCE. Zawiera pomysły, wskazówki i porady dotyczące organizacji procesów włączających studentów (ang. co-creation) w aktywności związane przede wszystkim z kształceniem oraz, w mniejszym stopniu, z prowadzeniem badań. Pokazuje przykłady działań tego typu prowadzonych obecnie na uczelniach tworzących konsorcjum ENHANCE.

Ufamy, że zaproponowany zestaw narzędzi pomoże studentom poznać szerokie możliwości zaangażowania się w działania ENHANCE oraz ułatwi organizowanie wydarzeń mających na celu zwiększenie udziału studentów w tego typu działaniach. Doradzamy studentom, jak skutecznie angażować się w takie działania, tym samym motywując i wzmacniając ich jako współtwórców procesów kształcenia i badań prowadzonych na uczelniach ENHANCE. Choć zaproponowany zestaw narzędzi jest przeznaczony przede wszystkim dla studentów, także kadra akademicka może znaleźć w nim przydatne źródło informacji i inspiracji.

Raport składa się z dwóch części.

W pierwszej części dokonano krótkiego przeglądu literatury dotyczącej udziału studentów w różnych formach działań prowadzonych na uczelniach. Omówiono kilka rodzajów zaangażowania i różne role studentów w procesie współdziałania z kadrą akademicką. Przykładowo, opisana „drabina" udziału studentów w opracowywaniu programu studiów pokazuje, w jaki sposób ich zaangażowanie w opracowywanie programu może ewoluować od braku interakcji, poprzez to, że dokonują oni pewnych wyborów i współdecydują o rozwiązaniach w określonym obszarze, aż do sytuacji, w której wywierają oni istotny wpływ na wszystkie procesy decyzyjne dotyczące programu.

Omawiane są również inne aspekty zaangażowania studentów w opracowanie programu studiów lub jego części – przedmiotu lub modułu, w tym:

- różne podejścia, w zależności od liczby studentów uczestniczących we wspólnych działaniach (od małej liczby do sytuacji, w której wszyscy studenci uczestniczą w tym procesie),
- różne podejścia do wspólnego działania (współtworzenie programu studiów lub przedmiotu vs. współtworzenie procesu realizacji kształcenia w ramach programu lub określonego przedmiotu).

Na podstawie przeglądu literatury przedstawiono również szerokie spektrum możliwych skutków, jakie niosą za sobą różne formy współdziałania studentów z kadrą akademicką w procesie tworzenia programu studiów.

W drugiej części raportu skupiamy się na sześciu wybranych kategoriach procesów współdziałania studentów z kadrą akademicką realizowanych na uczelniach, obejmujących:

- wspólne organizowanie wydarzeń i warsztatów,
- wspólne prowadzenie badań i realizowanie projektów naukowych przez studentów wspieranych przez kadrę,
- udział studentów w komisjach opiniujących przedmioty i programy studiów,
- udział studentów w procesie oceny prac innych studentów,
- udział studentów w tworzeniu przedmiotów i programów studiów,
- ocena przedmiotów przez studentów.

Przedstawione sześć kategorii procesów współdziałania studentów z kadrą akademicką odpowiada sześciu modułom w zaproponowanym zestawie narzędzi.

Dla każdego z tych modułów omówiono następujące zagadnienia:

- zachęcanie studentów do udziału we wspólnych działaniach: Co może stanowić dla studenta potencjalną zachętę do współdziałania z kadrą akademicką? Jak zachęcić studentów do włączenia się w realizowane wspólnie z kadrą przedsięwzięcia? Co może zniechęcić studentów do udziału w tego typu działaniach?
- korzyści i koszty: Czy potrzebujemy na uczelni współdziałania studentów z kadrą akademicką? Jakie są koszty (niekoniecznie w wymiarze finansowych) takiego współdziałania? Jakie są korzyści z takiego współdziałania (kim są jego beneficjenci)?
- organizacja: Jak zorganizować proces współdziałania studentów z kadrą akademicką angażujący wybranych studentów/całą grupę?

Następnie przedstawione zostały przykłady działań realizowanych z udziałem studentów na uczelniach ENHANCE, wskazujące możliwe obszary aktywności i stanowiące inspirację dla dalszego rozwoju współdziałania studentów z kadrą. Dla każdego modułu zaproponowany został scenariusz, który pokazuje studentom, jak skutecznie zaangażować się w dany kategorię wspólnych działań.

Raport przedstawia podstawowe koncepcje związane z sześcioma zidentyfikowanymi aspektami działalności uczelni, w których współdziałania studentów z kadrą może być szczególnie korzystne. Zostały one wstępnie omówione na spotkaniach grupy roboczej Higher Education Innovator. Proponowane zalecenia są oparte na wynikach warsztatu pt. „Workshop for modular training toolkit for students engaged in ENHANCE activities", zorganizowanego przez Politechnikę Warszawską 5 listopada 2021 r. Warsztaty zostały przeprowadzone online przy użyciu narzędzi WebEx i Miro. Wzięło w nich udział 13 osób z 6 uczelni ENHANCE: studentów, nauczycieli akademickich i pracowników administracji (https://workshop.enhance.pw.edu.pl/toolkitstudentscocreation).

Kit de recursos para la formación modular de los estudiantes que participan en las actividades ENHANCE
Resumen Ejecutivo

Proponemos el concepto de Kit de recursos de Formación para aquellos estudiantes interesados en participar en las actividades de ENHANCE. Seguidamente, se ofrecen ideas, sugerencias y consejos para organizar aquellos procesos que impliquen a los estudiantes en la co-creación de actividades asociadas principalmente a la enseñanza y el aprendizaje y a la investigación en menor medida. además, se añaden ejemplos de este tipo de actividades que actualmente se están llevando a cabo en las universidades socias de la Alianza ENHANCE.

Este Kit de recursos ayudará a los estudiantes a conocer todas aquellas oportunidades de participación en las actividades de ENHANCE y a organizar eventos destinados a aumentar la participación de sus pares en los procesos de co-creación. Se aconseja a los estudiantes sobre la forma más eficaz de participar en dichos procesos y, de este modo, motivarlos y empoderarlos como co-creadores de la educación y la investigación que tienen lugar en las universidades de ENHANCE. Aunque el Kit de recursos está destinado principalmente a los estudiantes, el personal académico también puede encontrar en él una fuente útil de información e inspiración.

El informe consta de dos partes.

En la primera parte se hace un breve repaso de la bibliografía existente sobre la participación de los estudiantes en los diversos formatos de actividades de co-creación que tienen lugar en las universidades socias en el contexto de la alianza. Se discuten varios tipos de compromiso y los diferentes roles de los estudiantes en los procesos de co-creación. A modo de ejemplo, la "escalera de la participación de los estudiantes en el diseño de los planes de estudios" muestra cómo el compromiso de los estudiantes en el desarrollo de un plan de estudios puede evolucionar desde una interacción esencialmente nula, pasando por tener cierta capacidad de elección y control de las áreas prescritas, hasta tener una influencia sustancial en todos los procesos de toma de decisiones relativos al plan de estudios.

También se consideran otros aspectos de la participación de los estudiantes en el desarrollo de un plan de estudios o de su parte -un curso o un módulo-:

- Diferentes enfoques en cuanto al número de alumnos que participan en la co-creación (una pequeña selección de alumnos frente a todos los alumnos que participan en el proceso de co-creación),
- Diferentes enfoques de la co-creación (co-creación del plan de estudios - antes de que tenga lugar el programa o el curso - frente a la co-creación en el plan de estudios – co-diseño del aprendizaje y la enseñanza dentro de un curso o programa, normalmente durante el curso o el programa).

También se presenta el amplio espectro de posibles resultados de los procesos de co-creación de los que se informa en la literatura.

En la segunda parte del informe nos centramos en seis tipos de procesos de co-creación preseleccionados que tienen lugar en las universidades socias, como son:

- La co-creación de eventos y talleres por parte de los estudiantes,
- co-investigación y realización de proyectos de becas por parte de los estudiantes con el apoyo del personal,

- La participación de los estudiantes en los comités de revisión del diseño de los cursos y del plan de estudios,
- coevaluación por parte de los estudiantes,
- Co-diseño de cursos y planes de estudio por parte de los estudiantes,
- La coevaluación de los cursos por parte de los estudiantes.

Estos seis tipos de actividad de co-creación corresponden a seis módulos de nuestro Kit de recursos.

Para cada módulo, se describen las siguientes cuestiones:

- incentivar a los estudiantes: ¿Cuáles son los posibles incentivos para que un estudiante participe en actividades de co-creación? ¿Cómo animar a los estudiantes a participar en la co-creación de actividades universitarias? ¿Qué puede disuadir a los estudiantes de participar en el proceso de co-creación?
- costes y beneficios: ¿Necesitamos la co-creación en la universidad? ¿Cuáles son los costes (no necesariamente monetarios) de la co-creación? ¿Cuáles son los beneficios (para quién) de la co-creación?
- organización: ¿Cómo organizar el proceso de co-creación con la participación de un pequeño grupo de alumnos o de toda la clase?

A continuación, se presentan ejemplos de actividades de co-creación que tienen lugar en las universidades de ENHANCE para mostrar posibles direcciones e inspirar futuros desarrollos. Por último, para cada módulo, se propone un escenario para asesorar a los estudiantes sobre cómo participar en un determinado tipo de proceso de co-creación de forma eficaz.

Los conceptos básicos presentados en el informe, relacionados con seis aspectos identificados de la actividad universitaria en los que la co-creación podría ser especialmente beneficiosa, se debatieron inicialmente en las reuniones del grupo de trabajo de Innovadores de la Educación Superior. Las recomendaciones propuestas se basan en los resultados del "Taller sobre Kit de recursos de formación modular para los estudiantes que participan en las actividades de ENHANCE", organizado por la Universidad Tecnológica de Varsovia el 5 de noviembre de 2021. El taller se realizó en formato online mediante WebEx y Miro, y contó con la participación de 13 representantes de las universidades ENHANCE: estudiantes, personal académico y personal de administración y servicios (https://workshop.enhance.pw.edu.pl/toolkitstudentscocreation).

Modulärt verktyg för utbildning av studenter som är involverade i ENHANCE-aktiviteter
Sammanfattning

Vi föreslår ett verktyg för studenter som är intresserade av att bli involverade i ENHANCE-aktiviteter. Vi föreslår idéer, tips och råd för att organisera processer som involverar studenter i samskapande aktiviteter som främst är kopplade till utbildning och lärande och i viss mån med forskning. Vi exemplifierar också med liknande aktiviteter som redan nu pågår vid ENHANCE-universiteten.

Vi tror att detta verktyg kan stödja studenter i att lära sig om de stora möjligheter som finns i att engagera sig i ENHANCE-aktiviteter och i att organisera event med målet att studenters medverkan i samskapandeprocesser. Vi ger studenter råd om hur de medverkar i sådana processer på ett effektivt sätt och motiverarar dem att delta i samskapande som rör utbildning och forskning på ENHANCE-universiteten. Även om verktyget främst är riktat till studenter så kan fakulteten också ha nytta av det som en källa för information och inspiration.

Rapporten har två delar.

Den första delen ger en överblick över relevant litteratur om studenters deltagande i olika typer av samskapande aktiviteter vid universitet. Flera typer av deltagande såväl som de olika roller studenter kan ha i samskapande processer diskuteras. "The ladder of student participation in curriculum design" visar till exempel hur studenters deltagande i utvecklingen av utbildningsutbudet kan utvecklas från i princip inget deltagande till att ha stort inflytande över alla beslutsprocesser som rör utbildningsutbudet. Däremellan finns olika grader av valmöjligheter och kontroller över utvalda delar.

Andra aspekter av studenters deltagande i utvecklingen av utbildningsutbudet, eller delar därav som en kurs eller en delkurs, diskuteras i termer av

- olika tillvägagångssätt vad gäller antalet studenter som deltar i samskapande (ett mindre urval av studenter kontra alla studenter)
- olika tillvägagångssätt för själva samskapandet (samskapande av utbildningsutbudet, innan ett program eller en kurs ges kontra samskapande av lärande och undervisning i en kurs eller ett program, vanligtvis under kursen eller programmets gång)

Den stora variationen av möjliga resultat av samskapandeprocesser som finns i litteraturen presenteras.

Den andra delen av rapporten fokusera på sex utvalda typer av samskapandeprocesser som vanligen sker vid universitet, nämligen:

- samskapande av event och workshop ledda av studenter,
- studenters deltagande i forskningsprojekt under handledning,
- studenters deltagande utvärderingsgrupper för kurser och program,
- kamratdömning,
- samskapande av kurser och utbildningsplaner och
- studenters värdering av kurser och program.

Dessa sex typer av samskapande aktiviteter motsvaras av sex moduler i detta verktyg.

For varje modul diskuteras följande frågeställningar:

- att uppmuntra studenter: Vilka incitament kan finnas för studenter att delta i samskapande aktiviteter? Hur kan vi uppmuntra studenter att bli involverade i samskapande av aktiviteter vid ett universitet? Vad kan avskräcka studenter från att delta i samskapandeprocesser?

- kostnad och nytta: Behöver vi samskapande vid universitet? Vad är kostnaden (inte bara monetärt) för samskapande? Vad är nyttan (för vem) av samskapande?
- organisation: Hur organiseras en samskapandeprocess som engagerar en mindre grupp studenter till en hel klass.

Därefter presenteras exempel på samskapande aktiviteter vid ENHANCE-universiteten för att visa möjliga riktningar och inspirera framtida utveckling. Till sist föreslås för varje modul ett scenario för hur universitetet hjälper studenter att engagera sig på ett effektivt sätt i olika samskapandeprocesser.

De grundläggande koncepten som presenteras i rapporten, som relaterar till de sex identifierade aspekterna av universitetsaktiviteter där samskapande skulle kunna vara särskilt givande, diskuterades först vid möten i arbetsgruppen för Higher Education Innovator. De föreslagna rekommendationerna baseras på resultaten från "Workshop for modular training toolkit for students engaged in ENHANCE activities" som organiserades av Warszawas tekniska universitet den 5:e November 2021. Workshopen genomfördes online genom WebEx och Miro. Fjorton representanter från sex ENHANCE-universitet deltog: studenter, fakultet och senior administrativ personal. (https://workshop.enhance.pw.edu.pl/toolkitstudentscocreation).

1. Introduction

The goal of the toolkit is to discuss the concept of co-creation at universities, which in general, involves students, teachers, researchers and administration. The goal is to empower students as co-creators of the teaching, researching and learning process.

This material was created on the basis of the WP3: HE Innovator group's discussion during its meetings and as the result of the participants' discussion of the workshop entitled "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised at the Warsaw University of Technology on 5th November 2021. This workshop was run using the "Online Chessboard Discussion" method which is the modification of the "Coffee table"/"World café" methods.

The **co-creation** is the process of creating something together (Björklund et al., 2017) and in this context together refers to the participation of the interested stakeholders. This approach is convenient when designing products that address (often partially) ill-defined problems, or when pursuing an innovative approach to the problem or an idea driving future transformations. The co-creation approach in design allows the product to be tailored to the needs of stakeholders.

The shown below Ladder of student participation in curriculum design (Bovill & Bulley 2011) presents how student engagement in the curriculum can range from no engagement within a dictated, staff-controlled curriculum to significant levels of student engagement with student control of the curriculum (see Fig. 1).
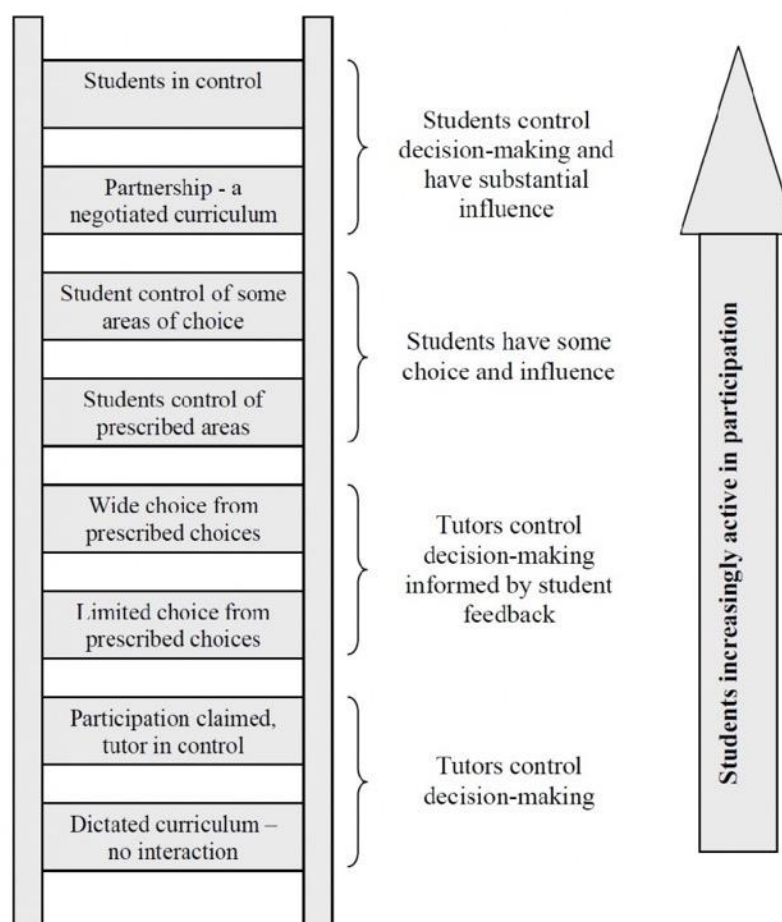
Figure 1 Ladder of participation in curriculum design (Bovill & Bulley, 2011 p.180)

2. Literature review

2.1. The roles of students in co-creation

Bovill et al. (2016) classify the participation of student in co-creation at university into four general roles: (i) a representative, (ii) a consultant, (iii) a co-researcher, and (iv) a pedagogical co-designer (see Fig. 2). Following (Bovill, 2020), there are different examples of student participation in co-creation at the university:

- students co-researching university-wide projects and acting as change agents (Dunne et al. 2011),
- students undertaking research and scholarship projects with staff (Werder and Otis 2010),
- student representatives collaborating with university staff on committees for quality assurance and enhancement purposes (Luescher-Mamashela 2013; Buckley 2014),
- students participating in course design review committees (Mihans et al. 2008; Rock et al. 2015),
- students as consultants providing the feedback on teaching observations (Cook-Sather et al. 2014; Huxham et al. 2017),
- students and teachers co-assessing work (Deeley 2014),
- students co-designing courses and curricula (Bovill 2014; Delpish et al. 2010),
- students co-evaluating courses (Bovill et al. 2010),
- students and staff writing collaboratively (Marquis et al. 2016),
- students involved in teaching and designing academic development work (Kandiko Howson and Weller 2016).
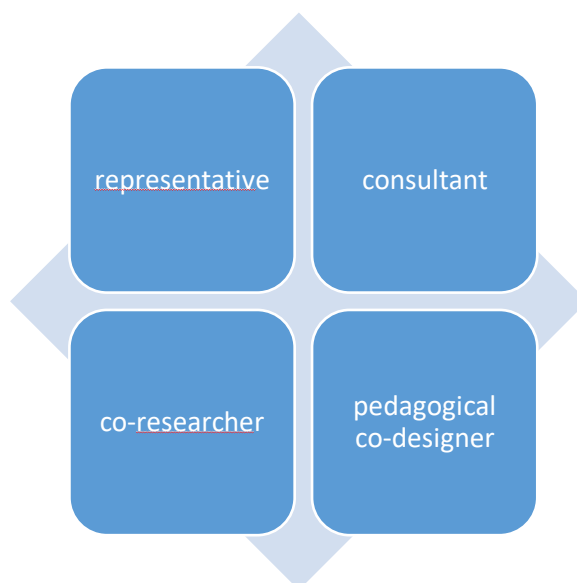
Figure 2 Roles that students adopt in co-creation work (Bovill et al. 2016)

2.2. Models and effects of co-creation

2.2.1. Number of students participating in co-creation

Bryson et al. (2015) distinguish two models of students' participation in co-creation processes:

- Model A: a small selection of students participates in the co-creation process.
- Model B: all the students participate in the co-creation process.

One should consider the following aspects: **which** model will be appropriate for the different roles students are taking on, the **efficiency** of a process with many students and the **incentives** for participating students.

2.2.2. Curriculum co-creation

According to Bovill and Woolmer (2018) the co-creation of curriculum can be organised following two approaches:

- Co-creation **OF** the curriculum: **before** the programme or course takes place.
- Co-creation **IN** the curriculum: co-design of learning and teaching **within** a course or programme, usually during the course or programme.

2.3. The outcomes of co-creation

The outcomes of whole-class approaches to co-creation (Bovill, 2020):

Table 1 Outcomes of whole-class approaches to co-creation (Bovill, 2020):

Outcome	Who?	Source
Improved academic performance or higher quality of work from students	Students	Bovill (2014); Deeley and Bovill (2017)
Enhanced skills for future professional development, including teamwork, critical reflection, and communication skills		Deeley (2014)
Learning beyond the course and transferring learning into new contexts/greater academic aspirations		Bovill et al. (2010)
Opened up the learning process to be more transparent		Deeley (2014); Bovill et al. (2010)
Process was fun		Bovill et al. (2010)
A shift from a focus on grades to learning		Delpish et al. (2010)
Increased confidence, enthusiasm, engagement, and motivation		Bergmark and Westman (2016); Bovill (2014); Bovill et al. (2010); Deeley (2014); Deeley and Bovill (2017)
Increased autonomy, self-regulation, and responsibility		Deeley and Bovill (2017)
Appreciated learning by doing and learning collaboratively with other students		Bergmark and Westman (2016); Bovill et al. (2010)
Practice at working democratically		Bergmark and Westman (2016)

Appreciated being asked to voice opinions		Bergmark and Westman (2016); Deeley (2014); Deeley and Bovill (2017)
Felt valued		Deeley and Bovill (2017)
Developed and experienced an equal relationship with the teacher		Bovill et al. (2010)
Lack of familiarity, shock at being invited to co-create a course		Bergmark and Westman (2016); Bovill (2014)
Enhanced identity, metacognitive awareness of learning and teaching, inspired, and/or transformed	Students and staff	Bergmark and Westman (2016); Bovill (2014); Huxham et al. (2015)
Creation of a learning community		Deeley and Bovill (2017)
Enhanced negotiation experience and skills		Bovill (2014); Deeley (2014)
Curriculum becomes more (socially) relevant		Bovill (2014); Bovill et al. (2010)
Student and teacher roles change		Bergmark and Westman (2016)
Felt risky and unpredictable	Staff	Bergmark and Westman (2016); Bovill (2014); Delpish et al. (2010)
Challenge in getting the pace of teaching right		Huxham et al. (2015)

3. The assumptions and the layout of a modular toolkit

A modular training toolkit contains instructions (manual) and tools (e.g. logic model/theory of change, workshop designs, policy and procedures, program evaluation) to build the activity. The activity is the co-creation of teaching and learning at the ENHANCE university. The modularity of the toolkit allows one to complete sections or modules of training according to one's time plan and availability.

In the toolkit we discuss the following areas where co-creation is worth applying. The areas are addressed in the following toolkit modules below (sections 4-9). Each toolkit module has the same layout and table of contents.

- Section 4: Co-creating of events and workshops by students.
- Section 5: Co-researching and undertaking scholarship projects by students supported by staff.
- Section 6: Students' participation in course and curriculum design review committees.
- Section 7: Co-assessing by students.
- Section 8: Co-designing courses and curricula by students
- Section 9: Co-evaluation of courses by students.

In these particular modules we address the following issues concerning co-creation.

- **Organisation**:
  - How to **make** the co-creation process engaging: a small selection of participants / whole community?
- **Encouraging students**:
  - What are potential **incentives** for a student to participate in the co-creation activities?
  - How to **encourage** students to co-create university activities?
  - What can **discourage** students from participating in the co-creation process?
- **Costs and benefits**:
  - **Do we need** co-creation at university?
  - What are the **costs** (not necessarily monetary) of co-creation?
  - What are the **benefits** (for whom) of co-creation?

The above issues were discussed during the "Workshop for modular training toolkit for students engaged in ENHANCE activities" (https://workshop.enhance.pw.edu.pl/toolkitstudentscocreation/) organised at the Warsaw University of Technology on the 5th of November 2021. The workshop was aimed at supporting the preparation of the modular training toolkit.

The workshop was conducted online with the use of IT tools: WebEx and Miro. The event was attended by a total of 13 representatives of six universities that make up the ENHANCE consortium: academics, administrative staff and students.

The aim of the workshop and the subsequent activities is to increase the participation of students as co-creators of the teaching and learning process through the participation of students in scientific research, design and implementation of scholarship projects together with university staff. It can also be through participation of students in evaluation committees of curriculum projects, participation of students in the evaluation process and co-creating courses and teaching programs.

During six online coffee table discussion sessions, participants developed the assumptions for the creation of training tools for students involved in ENHANCE activities, identified challenges facing the consortium and made recommendations for further activities. These activities include the need to

create a networking space for university stakeholders, and the problem of the relationship between the student and the teacher in the discussion process. Also, the need to implement projects for which there is a real demand and communication deficiencies in popular media among students and discrepancies in communication tools used by different groups. Finally, the need for bilateral transparency in the assessment process.

In the next sections, the examples of the application of a given co-creation process from partner universities are described. Finally, a selected scenario is described showing how to support students in each co-creation process.

4. Toolkit module: Co-creating of short time events by students

4.1. Overview

The implementation of various events (e.g. workshops, summer schools, hackathons etc.) is better suited to the needs of the participants and stakeholders when all interested stakeholders participate in the design, implementation, and summary process of the event. It should be highlighted that students are the key, however often neglected, target group of organizing these events.

4.2. Objectives

This toolkit aims to present tips and advice for organising events where students and university staff participate as organisers. The purpose of this material is to empower students as co-creators of this process.

4.3. The analysis of workshop conclusions

The following issues were discussed during the "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised at the Warsaw University of Technology on 5th November 2021.

4.3.1. Encouraging students

To discuss the issue of encouraging students to co-create the events, the following questions should be addressed:

- What are potential **incentives** for a student to participate in the co-creation activities?
- How to **encourage** students to co-create university activities?
- What can **discourage** students from participating in the co-creation process?

Students participating in the co-creation of events and workshops feel that they impact the decisions made at the university, which makes them feel "powerful". This affects the overall well-being of the student community and encourages students to get involved in further activities and initiatives. Their involvement also improves the relations with other organising groups (teachers, researchers, administrative) and thanks to it the mutual exchange of knowledge and experiences is possible. This exchange of experiences results in the acquisition or improvement of skills such as communication, organization and teamwork.

As the organisation of events takes place within the university, the cooperation of students takes place in a safe environment, which significantly improves the acquisition of knowledge and creativity. This, in turn, affects the quality of the designed solutions. Another advantage for students is expanding their network of contacts with the organisers and participants of the event.

On the other hand, some factors may discourage participation in such activities. That is why such factors should be analysed in detail to prevent their occurrence or minimise their impact. The factors over which we have no direct influence are the excessive burden on students overwhelmed with other duties, which means they do not want to or cannot engage in additional responsibilities.

The underlying problem is that students do not see the benefits of participating in the co-creation process. A common situation is that the developed solution has a direct impact on the people involved. Due to lack of communication, students are not informed about the course of the event or the reflections of its participants.

On the other hand, students' fear of responsibility, being judged and negative consequences on the part of teachers can be factors that result mainly from students' lack of information. These factors are critical and should be avoided as they may ruin further attempts to encourage students to participate in collaborative activities.

It is natural that students treat a teacher as a person of excellent knowledge and experience and are afraid of making mistakes. Therefore, while working on the organisation of events, a teacher who wants to cooperate with students should treat them as partners, listening carefully to their suggestions.

Another discouraging issue may be the lack of compensation (financial or non-financial) for participation in the co-creation process.

4.3.2. The Costs and the benefits of co-creation

To address the problem of costs and benefits of the processes of co-creation of the events by students and employees, the following questions should be addressed:

- **Do we need** co-creation at a university?
- What are the **costs** (not necessarily financial) of co-creation?
- What are the **benefits** (for whom) of co-creation?

The identified benefits for the students participating in the co-creation of events are the following. Students gain experience in implementing events, which translates into a better organisation of subsequent events. They also gain practise working in an often interdisciplinary team, which affects extra-curricular benefits such as implementing the specific learning outcomes.

The micro-credentials (e.g. badges) which are agreed on and respected by all universities belonging to the consortium can be one of the benefits offered for students by the university. The official acknowledgment of students' involvement published in event materials (e.g. educational or informational) can be another benefit for students.

A natural advantage for those working on organising an event is sharing different points of view as this is the natural consequence of working in a diverse environment. Students can integrate the knowledge from various, previously completed courses, e.g. organisation management and language skills.

It has also been noticed that organising events could be a source of income (e.g. tickets, sponsorship fees) for the host institution and its organisers. This is an additional incentive for people participating in the organisation of events.

Of course, the organisation of events involves additional costs of renting a space (if it is a stationary event), hiring technical support (if it is an event using IT tools) or catering (if the event is stationary and longer lasting). The organisational costs must also be taken into account.

The time devoted to both the organisation of and participation in the event is essential. Therefore, it is crucial to ensure that the organisation and the event are time efficient and organised when students have free time.

4.3.3. The organisation of the co-creation process

When analysing the co-creation of events, the following question needs to be answered.

- How to organise the co-creation process to engage a small selection of participants and /or the whole community?

One of the crucial problems related to the organisation of events is to ensure an appropriate number of people willing to cooperate. Unfortunately, it is not obvious where to find them. During the workshop, it was proposed to search for such people on social media related to the University (e.g. Facebook, Instagram) through both official (administrative support is required) and informal channels (support from administrators of these groups is needed). Besides, student clubs, groups, guilds, etc. can be contacted and encouraged to support these initiatives. As it is easier to involve student teams interested in the event's subject, it is often recommended to look for volunteers among student teams interested in the particular subjects.

The rewards (from minor to more meaningful) and remuneration in the form of food (e.g. pizza) were also considered.

4.4. Examples

The following examples of co-creating events (not necessarily carried out in the best way possible) at different universities are presented below.

4.4.1. Organisation of Design Thinking Week 2018 at WUT

Different groups of academic teachers, administrative staff and students were involved in the organisation of the Design Thinking Week 2018[1] at Warsaw University of Technology. During one of the meetings (3rd October 2018), the following scenario was implemented.

The main coordinator of the event (a person who worked as a member of administrative staff and was a PhD student at WUT) presented the agenda of the meeting. The following points of the meeting agenda concerned the specific areas such as a nationwide website of the event, patronage, promotional materials, poster design, discussion of individual workshops to be conducted, and promotion in social media.

The discussion was inclusive and conducted on an equal footing. Participants were using first names not titles when addressing each other. Not using titles is an important change in case of Poland as the Poles tend to be very formal. Each participant could engage in a discussion and express his/her opinion, which was considered on an equal basis. The discussion moderator (coordinator) organised the discussion and aimed to ensure that each area was covered. The coordinator was also responsible for making sure that the meeting's action points were followed. Minutes were sent when the meeting was over.

4.4.2. TU Berlin: Project laboratories and TU projects

What are Project Laboratories and TU projects? Project Laboratories and TU projects give students the opportunity to self dependently work on practical, interdisciplinary and innovative projects, which are related to their regular studies and expand them. The general orientation for the projects is a socially useful, environmentally friendly science and technology. The projects receive support and consulting services from the professors and the central University institutions, like kubus – the Science Shop of TU Berlin.

Learn differently: When students take over teaching Where can you find this? Studying without professors or academic assistants, only looked after by tutors; choosing the topics yourself and having the option to get the Project Laboratory or TU project credited to one's student account. All this is possible at TU Berlin - within the so-called „Project Laboratories for socially and ecologically useful thinking and acting" and similar "TU projects". Any students who can find other interested students can realize these workshops, only having to fulfil the following conditions:

- The projects should allude a topic that is not covered by regular studies at TU Berlin.
- In didactic terms, the project should offer an alternative to regular teaching methods at TU Berlin.
- The Project Laboratory and TU projects should be ecologically and socially usable and/or interdisciplinary.

Further information:

https://www.projektwerkstaetten.tu-berlin.de/menue/english_info_project_labs/

---

[1] a national event promoting the use of the Design Thinking method. It lasted a week all across Poland and assumed the organization of various events in various institutions all over the country

4.5.   Suggested scenario

The scenario of a **single meeting** for the organisation of the events is presented below.

4.5.1. Overview

This material provides the scenario of a single meeting for the organisation of the event. The meeting involves different stakeholders of the University (e.g. teachers, researchers, administration staff, students) and possibly other partners (e.g. industry/business/administration representatives).

4.5.2. Objectives

The objective of the meeting is to discuss the current issues of coordination of the event and distribute tasks among participants.

4.5.3. Target participants

- the coordinator of the event,
- a group of people organising the event (students, teachers, researchers, administrative staff, etc.).

4.5.4. Format

The discussion on the topics included in the agenda.

To encourage everyone to get involved in the discussion, the token method is recommended. A token is passed from one participant to another and whoever has a token should take the turn to talk.

4.5.5. Duration

Suggested duration: 30-90 minutes

4.5.6. Resources

Agenda, whiteboard, markers

4.5.7. Description

The objectives of the single meeting should focus on the following aspects:

- what is the status of work on individual issues (e.g. workshop topic, promotion, patronage)?
- who is responsible for each point? (if agreed)
- agenda of the meeting - what needs to be discussed and agreed on?

During the meeting, the coordinator starts a discussion on each of the topics on the agenda. During the debate, each meeting participant may comment on the discussed topic, regardless of his/her status. The coordinator's task and the person responsible for a given area are to consider all opinions in the discussion and decide on further work.

During each meeting, the coordinator should ask about problems in the implementation of specific issues. After the meeting, the coordinator sends the account of the session (the minutes) to the participants.

5. Toolkit module: Students co-researching and undertaking scholarship projects with staff

5.1. Overview

Research and scholarship projects are one of the main activities of the university staff. Students' participation in this process on an equal basis is the topic of the toolkit.

5.2. Objectives

This toolkit aims to present tips and advice for organising processes where students are co-researching and undertaking scholarship projects with staff. The purpose of this material is to empower students as participants in these processes.

5.3. The analysis of workshop conclusions

The following issues were discussed during the "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised at the Warsaw University of Technology on 5th November 2021.

5.3.1. Encouraging students

When discussing the issue of encouraging students to co-research and undertake scholarship projects with staff, the following questions should be addressed.

- What are the potential **incentives** for a student to participate in the co-creation activities?
- How to **encourage** students to participate in co-creating university activities?
- What can **discourage** students from participating in the co-creation process?

The participants of the workshop pointed out to a few crucial issues. The suggested topics of research and scholarship projects should be in line with current trends, market demands, and social challenges. Students in cooperation with research staff should also be given freedom to define or specify generally identified research challenges. Thanks to the fact that students have the opportunity to participate in research, learn about the ways, challenges and the methods of conducting it, it is probable that they will start doctoral studies. The proposed project subjects can also be addressed to students in the above manner.

All methods of informing the scientific, student and industry community by students - co-creators of the results obtained should be promoted by proposing and financing participation in conferences, seminars and publication of articles.

Students participating in research devote their time to conducting it and thanks to this involvement they gain valuable skills and knowledge. If the university allows it, their work can be rewarded with an appropriate number of credits (for example ECTS). Awarding credits can also be approached systemically and included in the degree programme requirements. It is also possible to propose a relevant microcredential offered by the ENHANCE consortium.

5.3.2. Costs and benefits

To address the problem of costs and benefits of the processes of co-researching and undertaking scholarship with students and employees, the following questions should be addressed:

- **Do we need** co-creation at a university?
- What are the **costs** (not necessarily financial) of co-creation?
- What are the **benefits** (for whom) of co-creation?

The cost of involving students in collaborative research includes additional time spent on recruiting, introducing, and supervising new members of a research team. If this process is well and efficiently organized, then the cost (in terms of the time spent) is outweighed by its outcomes. Therefore, it is

important to have know-how, good practices, or effective processes of acquiring students or matching students and researchers.

A big challenge is the lack of systematized and shared knowledge about what research teams are currently working on or planning. In order to encourage students to participate in research, they should be involved in applied research. The emphasis should be put on sharing the knowledge about ongoing and planned research. Students should be encouraged to conduct research in interdisciplinary, intercultural and international teams. Such teams should be more open due to their diversity and different points of view. For students participating in research, this is a valuable experience that will be useful in their later careers.

5.3.3. The organisation of the co-creation process

Analysing the organisation of co-researching and undertaking scholarship the following question is to be answered.

- How to organise the co-creation process to engage a small selection of participants and /or the whole community?

The problem that has been identified is the large number of students in relation to the number of research teams that could efficiently engage students to collaborate. On the other hand, a small number of students is relatively easy to get involved.

The challenge will be to match (even in terms of interests) students and research teams properly. A recommended solution will be the use of IT tools (e.g. social media such as Facebook, Instagram). However, it should be remembered that in addition to the fact that such platforms are being used, they should be supplemented with appropriate content by research teams wishing to involve students in research.

The habits related to the tools used for everyday communication may be a certain barrier in this process. While researchers most frequently use email, students prefer other methods (messenger, WhatsApp).

5.4. Examples

The following examples of co-researching and undertaking scholarship with students and employees (not necessarily carried out correctly) at different universities are presented below.

5.4.1. X-tutorials: Research tutorials by students for students, TUB

The Berlin University Alliance promotes student-based research tutorials for students keen to do research and who want to experiment, develop, analyse, research or evaluate a topic in a self-organized project together with other students. With the X-Tutorials the Alliance is supporting students with a particular interest in research and in doing so is strengthening the link between research and teaching.

X-Tutorials are research tutorials that run over the course of one or two semesters. They are initiated by students and carried out by them independently. Together with other students, they conduct research in student teams on a topic of their interest. Of course, cooperation can be organized with other institutions in the Berlin area, for example with social actors (non-governmental organizations (NGOs), museums, associations, political organizations) or with other research institutions.

5.4.2. X-Student Research Groups, TUB

Research teams made up of junior researchers and students. With the X-Student Research Groups the Berlin University Alliance is supporting research teams made up of junior researchers and students. The aim is to involve students in current research projects of partner institutions and enable them to participate in top-level research at an early stage of their studies.

The X-Student Research Groups are organized in the form of research seminars and usually run over the course of a semester. This gives junior researchers the opportunity to transfer their own research into teaching and to gather the initial experience in managing research groups.

The Berlin University Alliance sponsors up to 32 X-Student Research Groups every year. Junior researchers can apply for funding twice a year as part of the "Call for Proposals".

5.4.3. Research Project, WUT

The course entitled "Research Project" is an interesting example of such a co-creation. This course is dedicated to the students of Intelligent Systems specialization in the field of Computer Science (master's degree). Students learn how to conduct scientific research in the context of developing, testing and implementing broadly understood intelligent systems. It is assumed that students join research and develop existing project at WUT, or they can formulate their own theses and research them. Students work in small teams (2-3 people) under the supervision of a teacher. The project will result in a research paper, a conference submission together with a poster, or a report (or its part), ready for publication.

According to both the people responsible for running the Research Project course and the University authorities involving students in scientific research can contribute to strengthening the potential of research projects conducted by teams from the Warsaw University of Technology.

For students, it is a valuable experience as it prepares them well for both research work (at a university, research institute, R&D department of a company, etc.) and for their master's projects. At the same time for research teams, it is an opportunity to strengthen the team and to look at the process of solving a problem from a different perspective.

The expected thematic scope of research carried out by students may relate to various research issues, although the extracted research task should include a component related to broadly understood intelligent systems. It needs to be highlighted that interdisciplinary projects are welcomed. The examples of this type of projects include models supporting renewable energy installations, the optimization of transport services in Smart City, and the analysis of the spread of COVID-19.

5.5. Suggested scenario

The scenario of a **single workshop** of a course like Research Project described above is presented.

5.5.1. Overview

This material presents the scenario of a single workshop in a course related to conducting research by teams of students (like Research Project described above). It is assumed that the course consists of a project part and a workshop part. During a project part students work independently and during a workshop part students meet with their tutor and discuss progress.

5.5.2. Objectives

The objective of the workshop is to discuss the current state of the research projects carried out by students. At the same time the aim is to introduce some aspects of knowledge related to the research process and to the specific topic of the research.

5.5.3. Target participants

- Students organised into teams.
- The teacher who conducts classes and moderates the discussion.
- The group tutor (not necessarily the same person as the teacher) who proposes a general research topic and supports the research.

5.5.4. Format

The single workshop is divided into five parts. The workshop timeframe is approximate.

- Discussion of the progress made by the research groups (ca. 25 minutes).

- A short theoretical introduction done by the teacher (e.g. a review of research methods) (ca. 20 minutes)
- Work in groups on the selection and clarification of research methods (ca. 20 minutes)
- Sharing results and discussion (ca. 15 minutes)
- Wrap-up and homework assignment (ca. 10 minutes)

5.5.5. Duration

90 minutes

5.5.6. Resources

Markers, post-its

5.5.7. Description

Each meeting has the following goals: checking the students' progress in the conducted research, providing them with the methodological knowledge regarding the current stage of research (e.g. conducting relevant literature studies, proper formulation of research hypotheses, their verification, planning the experiment, selection of appropriate research tools, research synthesis, writing an article) and discussing the problems they encountered and searching for solutions together.

6. Toolkit module: Students' participation in course design review committees

6.1. Overview

The educational offer of each technical university evolves with the development of science and technology. In order for newly created courses to be valuable to students, students should be involved in the design process both as course co-developers and as members of review committees. This toolkit addresses this process.

6.2. Objectives

This toolkit aims to present tips and advice for organising events where students participate in course design review committees. The purpose of this material is to empower students as participants in these processes.

6.3. Analysis of workshop conclusions

The following issues were discussed during the "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised at the Warsaw University of Technology on 5th November 2021.

6.3.1. Encouraging students

There is a need to answer the following questions to discuss the issue of encouraging students to participate in course design review committees.

- What are the potential **incentives** for a student to participate in co-creation activities?
- How to **encourage** students to co-create university activities?
- What can **discourage** students from participating in the co-creation process?

As working in the course evaluation committee takes a lot of time, this time should be compensated for. Offering students credits for their work on evaluating the course can be one way to compensate them for their time.

The need to provide academic knowledge should also be discussed with students so that they are aware that certain elements of the course are needed. The teachers appreciated and respected by students can take on the task of encouraging them to participate in this process more widely. Creating courses that they will be able to attend in the future is also an important incentive for students to get involved in this process. This can prove difficult due to the time it takes to create such courses, but it is not impossible.

6.3.2. Costs and benefits

To address the problem of costs and benefits of the students' participation in course design review committees, the following questions should be addressed:

- **Do we need** co-creation at a university?
- What are the **costs** (not necessarily financial) of co-creation?
- What are the **benefits** (for whom) of co-creation?

A significant benefit for students participating in this activity is gaining considerable experience and developing transferable skills such as teamwork and communication, etc. In turn, a benefit for teachers is to get new insights which will enhance their teaching. A problem with this process is its continuity because there are new students all the time. It follows from the fact that, first of all, students' expectations are changing, and the established courses are becoming obsolete. Secondly, students should still be prepared to participate in the design review committee. On the other hand, the constant influx of new candidates keeps the results of the committee's activities up to date.

6.3.3. The organisation of the co-creation process

To analyse the organisation of students' participation in course design review committees, the following question is to be answered.

- How to organise the co-creation process to engage a small selection of participants and /or the whole community?

To organize the process of participation in a course design review commitee, it is good to get started with a small group of already engaged and interested students. Then they can be encouraged to share their knowledge and experiences (e.g. in social networks) with each other. In this way everybody will feel involved. At the same time appropriate questionnaires should be designed to involve a larger part of the student community. Thanks to this, more opinions on students' preferences regarding the courses to be designed can be obtained.

6.4. The examples

6.4.1. Reviewing courses and curricula by WUT's Student Self-Government

At the Faculty of Electronics and Information Technology, Warsaw University of Technology (WUT), a periodic review of degree programmes offered by this Faculty (degree programmes in 7 fields of study) is conducted. The final discussion on the related curricula takes place at the meetings of the Education Committee – the advisory body established by the Faculty Council. Students' representatives are permanent members of this Committee. They represent the Faculty's Student Self-Government, which has its own Education Committee. This Committee collects the opinions of students involved in curricula development (see section 8) and assessment of courses (see section 9). Any essential change in the curriculum requires a formal written opinion of the Student Self-Government. It is very unlikely that the Faculty Council approves the proposed changes without the students' positive opinion.

One of the students actively involved in reviewing courses and curricula said: "*During my undergraduate studies, I took part in the work to enhance degree programmes at my faculty. I mostly collected students' opinions about the proposed changes, new courses and class schedules. I was also looking for students' opinions about the curricula, like what they want to change, which part of curricula was not helpful in looking for a job etc. Due to that contribution, several changes were made, and some approaches changed, for instance, considering the fact that many students would like to have most, or all their classes scheduled in one or two days to be able to work during their studies. Finally, I also wrote a few Student Self-Government's opinions on courses and curricula for the faculty authorities.*"

Similar procedures are adopted at other WUT faculties. The final decisions on curricula are made by the WUT Senate upon the recommendation of its Education Committee. Similarly to the case of individual faculties, the opinion of WUT's Student Self-Government representatives sitting on the Senate's Education Committee is essential for a positive recommendation for curriculum changes proposed by a given faculty.

6.5. Suggested scenario

Student committee members who give their opinion on the curriculum may need to consult their colleagues in order to express their opinion properly. Workshops for students organized by student members of the committee are described below.

6.6. Overview

The scenario describes the organization of a workshop for students. During this workshop student members of the course design committee describe the assumptions of, for example, a new education program, and the participants express their opinion. The scenario uses the SWOT method.

6.7. Objectives

The aim of the workshop is to obtain the opinions of a larger number of students regarding the reviewed proposal. This proposal may include, for example, a new or revised educational program.

6.8. Target participants

Students.

6.9. Format

The presentation of the assumptions of the new educational program followed by a Q&A session and a SWOT workshop.

6.10. Duration

Suggested duration: 180-240 minutes.

6.11. Resources

Post-its, whiteboard, markers, a projector, pizza.

6.12. Description

The workshop begins with the presentation of the main assumptions of the new educational program by a member of the course design committee (or by its authors) (ca. 30 min.).

Then the Q&A session is conducted to clarify any doubts (ca. 30 min.).

Then the participants are divided into small groups (3-6 people). They jointly create a SWOT analysis of the proposed educational program by listing single strengths, weaknesses, opportunities and threats on separate posts (ca. 30 min).

This is followed by a discussion of each SWOT (starting with the S), with each group discussing one post-it and placing it on a shared whiteboard. Then the other groups post their post-its. During this stage, proposals are grouped, and possibly new ones are added (ca. 60-90 min).

The result of the workshop is an in-depth SWOT analysis of the proposed program made by a group of students. It will be the basis for the final opinion.

7. Toolkit module: Students' co-assessing

7.1.   Overview

The process of assessing student works is directly related to teaching. This process needs to be transparent and objective. Including students in this process increases the transparency of the assessment. At the same time a properly designed assessment process makes it objective, regardless of who is making the assessment.

7.2.   Objectives

This toolkit aims to present tips and advice for organising events where students participate in co-assessing. The purpose of this material is to empower students as participants in this process.

7.3.   Analysis of workshop conclusions

The following issues were discussed during the "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised at the Warsaw University of Technology on 5th November 2021.

7.3.1. Encouraging students

To discuss the issue of encouraging students to participate in co-assessing, there is a need to answer the following questions

- What are potential **incentives** for a student to participate in the co-creation activities?
- How to **encourage** students to co-create university activities?
- What can **discourage** students from participating in the co-creation process?

It should be noted that the process of mutual evaluation by students (peer-assessment) is difficult. In order to encourage students to participate in this process, we suggest that they should follow a sample exam grading done by the professor to focus on the errors (but also positive elements). Such activities expand their knowledge and strengthen the student-teacher relationship. Students' involvement in defining the criteria and assessment methods contributes to organizing and facilitating the assessment process (also for the teacher). At the same time, thanks to their involvement, students are better aware of the whole assessment process. Self-assessment is also an effective learning method as it allows to learn about one's own mistakes.

7.3.2. Costs and benefits

To address the problem of costs and benefits of the students' participation in co-assessing, there is a need to answer the following questions.

- **Do we need** co-creation at a university?
- What are the **costs** (not necessarily financial) of co-creation?
- What are the **benefits** (for whom) of co-creation?

The incentives for students to participate in the co-assessment process are: increasing the transparency of the assessment process, better understanding of feedback received from teachers, understanding what the evaluation process involves and understanding why students are assessed in a certain way. In addition, a discussion about learning outcomes and how to fulfil them can be initiated. Students are more involved in the course but will also be more prudent in delivering reports or presentations. On the other hand, there is a risk of subjective evaluation of colleagues. There may also be a concern that other peers would not be able to provide objective evaluations.

7.3.3. The organisation of the co-creation process

Analysing the organisation of the students' participation in co-assessing incurs a need to answer the following question.

- How to organise the co-creation process to engage a small selection of participants and /or the whole community?

The organization of the co-assessing process should be thoroughly prepared due to the sensitivity of the matter. The assessment process should be anonymous in order to be clearer and more honest without the fear of students being critisised after giving a bad grade. The overall assessment should involve students'self-evaluation,which should not be the core but a part of the evaluation process. Moreover, not all courses are suitable for co-assessing. However, courses that are particularly suitable for co-assessing are the ones in which projects (including team projects) are to be assessed.

To facilitate the assessment process by students, it would be useful to prepare the criteria, e.g. in the form of a table to be filled. It could also be recommended to prepare the set of minimal requirements for co-assessment and discuss them with students at the very beginning of the course. It is also worth highlighting that one student should not assess too many colleagues.

7.4. Examples

The examples of co-creating events (not necessarily carried out correctly) at different universities are presented below.

7.4.1. Students co-reviewing the reports

At Warsaw University of Technology, the students taking the "Agent and Actor Decision Systems" course (it is the master's degree course dedicated to the Intelligent Systems specialization in the field of Computer Science) are divided into teams and one of the assignments given to each team is reviewing another team's report. The sections of the report that are subject to review concern the **design** and **implementation** of a multi-agent system.

The students are expected to write short reviews of each of these two sections during the semester (after these sections have been submitted by their peers). The review should contain identified deficiencies, inconsistencies, and suggestions for alternative solutions. It needs to be stressed that the students are not supposed grade the report.

The review is anonymous (for the students) and students use a simple questionnaire where they enter their comments about the review together with their name, group and other necessary information. Only the teaching team has access to this personal information. The students receive anonymous reviews of their reports, and it helps them in the next stages of the work on the project. Consequently, they can use the received comments and suggestions to improve their project.

Due to the fact that each team usually receives 3-6 reviews (as well as the teacher's comments), they gain a lot of comments with different points of view. It should be pointed out that the content of the review does not affect the evaluation of the report.

7.4.2. Peer-assessment

Various forms of peer assessment (co-assessing by students) are applied within the elective course of "Presentation techniques" offered to the undergraduate students at the Faculty of Electronics and Information Technology, Warsaw University of Technology.

One of the students' tasks in this course is to write a short research report (3-4 pages) on the work done for a design project within some other courses taken at the faculty. Then such a report is reviewed and graded by the instructor and one other student. The review is done using a form containing ca. 25 closed questions and the field for general comments and the detailed comments are to be inserted into the text of the report. The author of the report receives only the review done by the instructor (the review form and the report annotated with these detailed comments). The assessment done by the student is not presented to the author's report and has no impact on his/her grade but is subject to grading by the instructor (mainly for relevance and quality of the general comments).

As the next assignment each student gives a 10-minute presentation on the project described in his/her report. The presentation is assessed by two instructors and two designated students, using the form containing a few closed questions and the field for general comments. During the presentation, other students fill out a simple on-line questionnaire containing only closed questions. The concept of Bring Your Own Device (BYOD) is applied if the course is taught on-campus. Then a discussion on the strengths and weaknesses of the presentation takes place in which both the students and instructors participate. As a result, the author of the presentation receives the ample feedback (summative assessment from the instructors and anonymised formative assessment from the students). The two students designated to assess the presentation comprehensively are graded for relevance and quality of their comments.

The third assignment the student has to complete is to record a 3-minute video on the earlier presented project, following the rules of the British Council FameLab contest (https://www.britishcouncil.org/education/he-science/famelab) and upload it to the course website so that the whole class could access it. The other students are asked to review several videos prepared by their colleagues and are graded for their reviews. Then, the selected parts of the students' videos are presented and commented on by the instructors in class. This way, each student receives ample feedback in the form of both summative assessment (a review and grading by instructors) and formative assessment (general comments by the instructors in class, anonymised reviews from other students).

The above-described co-assessment concepts are universal in the sense that they can be applied regardless of whether on-campus or on-line teaching (in the time of COVID-19) takes place.

7.5.   Suggested scenario

The scenario of a **meeting** preparing students for a peer assessment is presented.

7.5.1. Overview

Preparation of students to peer assessment.

7.5.2. Objectives

The meeting aims to prepare students to evaluate the work of their colleagues.

7.5.3. Target participants

Students participating in peer assessment

7.5.4. Format

A short meeting with Q&A.

7.5.5. Duration

30-45 minutes

7.5.6. Resources

It is essential to have the form (on-line or printed) for peer assessment. The examples of descriptive assessments with the teacher's comments on the quality of the assessment.

7.5.7. Description

The meeting should start with a brief discussion on the goals of the peer assessment, highlighting the advantages for both parties (the evaluator and the person being evaluated). Then the teacher should discuss the assessment form prepared in advance, paying attention to the clarity of the description and the purpose of the individual items in the form. The questionnaire should not be too extensive to avoid boredom. It should be clearly described how to carry out the assessment. It is vital to ensure the anonymity of the evaluators; therefore, online forms are recommended.

Afterwards, a teacher should organize a Q&A session to clarify any doubts.

8. Toolkit module: Students co-designing courses and curricula

8.1. Overview

The educational offer of each technical university evolves with the development of science and technology. For newly created courses to be valuable to students, they should be involved in the design process, both as course co-developers and also as members of review committees. This toolkit discusses this process.

8.2. Objectives

This toolkit aims to present tips and advice for organising events where students participate in co-designing courses and curricula. The purpose of this material is to empower students as participants in this process.

8.3. Analysis of workshop conclusions

The following issues were discussed during the "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised at the Warsaw University of Technology on 5th November 2021.

8.3.1. Encouraging students

To discuss the issue of encouraging students to participate in co-designing courses and curricula, the following questions should be addressed.

- What are potential **incentives** for a student to participate in the co-creation activities?
- How to **encourage** the students to co-create university activities?
- What can **discourage** students from participating in the co-creation process?

The following ideas can serve as incentives for students to participate in the co-creation of courses and programs: gaining experience in course design, improving education and being drivers for change, developing transferable skills such as communication and management, etc. Students can also gain the understanding of education as a whole, get to know university employees not only as lecturers but as managers and creators of education programmes. It can be an example that students can influence university education and their opinions matter. They can report back to the whole student body on the progress based on students' feedback, suggestions and criticisms. It is also possible to offer students financial remuneration for their work in this process (if the university decides to allocate the funds to such activities or if the creation of programs is financed from projects). Other forms of rewards offered to students are also possible, e.g. a voucher for the university campus store.

The fear of lack of experience and self-confidence may discourage students from participating in this activity. Students will be discouraged if they are not taken seriously and if their opinions do not matter.

8.3.2. Costs and benefits

To address the problem of costs and benefits of the students' participation in co-assessing courses and curricula, the following questions should be addressed.

.

- **Do we need** co-creation at a university?
- What are the **costs** (not necessarily financial) of co-creation?
- What are the **benefits** (for whom) of co-creation?

Students can play an essential and non-negligible role in the course and curricula development. Their point of view should not be neglected or disregarded. Courses should be developed on the basis of cooperation between students and professors, with the participation of people who will participate in teaching, i.e. tutors, assistants, etc. The participation of students will allow them to focus on the most

important elements of the course because only students are fully aware of their limitations, gaps in knowledge and they will primarily apply knowledge into practice.

8.3.3. The organisation of the co-creation process

Analysing the organisation of the students' participation in co-assessing courses and curricula incurs the need to answer the following question.

- How to organise the co-creation process to engage a small selection of participants and /or the whole community?

The co-creation organization process regarding courses and curricula design should include designing and creating videos explaining the purpose of the curricula, courses, and co-creation and publishing such videos in media popular with students (e.g. social media).

The big challenge is to encourage students to participate in the design of educational programmes. Apart from students, employers and other relevant stakeholders should be involved in the development of new programs and courses.

The potential cost is primarily the time that should be spent when participating in the process.

8.4. The examples

8.4.1. Students co-designing new degree program at WUT

For the last several years students have played an essential role in the development of new educational programmes (and updating the existing ones) at the Faculty of Electronics and Information Technology, Warsaw University of Technology.

Students were particularly active when the first-cycle degree programme in Cybersecurity was being developed in 2018 (the programme was first offered in the 2019/2020 academic year). During the whole 10-month development time, student members of the team established to design the curriculum (besides members of academic community, the team included also – as consultants – external experts representing employers) shared their experience resulting from Erasmus+ exchange as well as their professional experience (most Faculty students work when studying), expressed their expectations regarding both the contents and the teaching methods. As a result, a very student-friendly curriculum was created. Its distinctive feature is an innovative concept of the first semester, designed to reduce the stress of new students, facilitate their integration and adaptation to the new learning environment, give them some relevant hands-on engineering experience (team work on designing and implementing simple robots). At the same time, it reduces the workload and stress associated with fundamental science courses by moving a significant part of teaching Maths from lecture halls to laboratories where students play with Mathematica and similar tools.

This new degree programme has been very well received by the candidates for studies (attracting each year more than 20 applicants for each study place), students and other stakeholders. The Ministry of Digital Affairs recommended this programme as a model to be followed by other Polish universities.

The team that developed the programme received a prestigious award of the Polish Minister of Education and Science for outstanding achievements in education. An unprecedented fact related to this award was that among its recipients there were two students (Minister's awards are intended for academic staff). It is also worth mentioning that the application for this award received very favourable recommendations from, inter alia, the President of the Polish Students' Parliament – the body representing all Polish students.

Following the success of the programme in Cybersecurity, the first-cycle degree programme in Internet of Things Engineering was developed and offered first time in the 2020/2021 academic year. A similar approach, characterised by very active participation of students in the curriculum development process, was adopted and even more innovative solutions were introduced. In each semester starting from the first one, the curriculum includes a large project-based learning (PBL) module (10-12 ECTS

points) where students work in teams on IoT solutions of real-life problems submitted mostly by external institutions – a solution unique for Polish universities. The programme attracted the largest number of candidates (over 30 applicants for each study place) among all first-cycle degree programmes offered by Polish universities, demonstrating again the benefits of co-designing of a curriculum by students.

8.5. Suggested scenario

The scenario of a **single meeting** of a team developing a new educational programme is presented below.

8.5.1. Overview

This material provides a scenario of a single meeting of a team developing a new educational programme. The meeting involves different stakeholders of the university (e.g. teachers, researchers, administration, students) and possibly industry partners (employees). It is assumed that there is a person (most often an experienced professor) who is the team leader. The team secretary (e.g. doctoral student or student) is responsible, inter alia, for organizing the team's work, prepares the agenda and the minutes.

8.5.2. Objectives

The objective of the meeting is to discuss the current issues of composing a new educational programme (e.g. discussion of the selection of courses) and distribute tasks among participants. Before the meeting, the agenda is sent to the participants.

8.5.3. Target participants

For the team designing a new programme to be able to design a solution that is good for both academic and research staff of the university, students and future employers, this team should include people representing each of these groups. In addition, a person who is familiar with the regulations and conditions of the department should be part of this team.

8.5.4. Format

Discussion on the topics included in the agenda. In particular, each group of stakeholders should address important issues.

8.5.5. Duration

Suggested duration: 60-90 minutes.

8.5.6. Resources

The agenda, a whiteboard, markers, a projector (if necessary)

8.5.7. Description

The single meeting focus on the following aspects:

- what is the status of work on individual issues (e.g. selection of the courses, discussion of opinions on syllabuses)?
- who is responsible for each issue (if agreed)?
- the agenda of the meeting - what needs to be discussed and agreed on?

During the meeting, the coordinator starts a discussion on each topic on the agenda. During the debate, each meeting participant may comment on the discussed topic. In particular, student representatives should participate in the work on the shape of the future educational programme and give opinions on its elements (syllabuses: loading, practical and substantive value, student workload for subsequent semesters, etc.).

During each meeting, the coordinator should ask about problems in implementing specific issues. After the meeting, the coordinator sends the account of the meeting (the minutes) to the participants.

9. Toolkit module: Students co-evaluating courses

9.1. Overview

In order to maintain a high quality of educational provision and to meet the changing requirements of students, there is a need for continuous evaluation of the courses and curricula provided. All stakeholders, in particular students, should participate in this process.

9.2. Objectives

This toolkit aims to present tips and advice for organising events where students participate in co-evaluating courses. The purpose of this material is to empower students as participants in this process.

9.3. Analysis of workshop conclusions

The following issues were discussed during the "Workshop for modular training toolkit for students engaged in ENHANCE activities" organised at the Warsaw University of Technology on 5th November 2021.

9.3.1. Encouraging students

When discussing the issue of encouraging the students to participate in co-designing courses and curricula, the following questions should be addressed.

- What are potential **incentives** for a student to participate in the co-creation activities?
- How to **encourage** students to co-create university activities?
- What can **discourage** students from participating in the co-creation process?

It is obvious that to make the course evaluation process possible and effective, the curricula should be transparent. A quantitative assessment is desirable, if only for statistical or comparative reasons. However, the solid qualitative feedback often motivates the teacher to improve and develop the course. The assessment should include, inter alia, the students' attitude to the course, whether his/her knowledge and skills have developed and whether the assumed learning outcomes have been achieved. The anonymity of the ratings is critical together with also the constant access to the ratings. Course designers, professors, and all teaching staff should be familiar with the evaluation criteria.

9.3.2. Costs and benefits

To address the problem of costs and benefits of the students' participation in co-assessing, the following questions should be addressed.

- **Do we need** co-creation at a university?
- What are the **costs** (not necessarily financial) of co-creation?
- What are the **benefits** (for whom) of co-creation?

Both students and teachers will benefit from a correctly conducted assessment. However, certain conditions must be met. Students should be aware and assured that their comments are taken into account and that they actually have an impact on the development of courses and curricula. Fulfilling this condition is difficult and requires ensuring and maintaining mutual trust of the student community and academic staff, in particular the university authorities.

9.3.3. The organisation of the co-creation process

Analysing the organisation of co-designing courses and curricula by students incurs a need to answer the following question.

- How to organise the co-creation process to engage a small selection of participants and /or the whole community?

A frequently used method of evaluating courses is to use anonymous questionnaires (digital or paper) that contain standardized questions. They are suitable for all courses and all students. Processing the results of all surveys can be a challenge, especially when they contain descriptive feedback.

Another solution may be the participation of a small group of students selected by students themselves in the evaluation of the course. They gather the feedback on the course through (often informal) conversations with their colleagues. The opinions obtained in this way will be more reliable. Then students can collaborate with professors and discuss desirable changes to the courses.

9.4. The examples

9.4.1. Evaluation feedback

Apart from the routine evaluation of courses at Warsaw University of Technology which takes place every semester using a standardised and relatively simple questionnaire, some teachers encourage students to provide more comprehensive feedback and design their own course questionnaires. Taking part in a survey based on such an extended questionnaire can be seen as an exercise in students' developing critical thinking and formulating assertive statements. Therefore, bonus points are sometimes awarded to those who fill out and submit the questionnaire (1 or 2 extra points with the 0-100 course grading scale) to additionally encourage students to provide their feedback. However, it is worth pointing out that explaining how the previously received comments were used to enhance the quality of educational provision is the most effective incentive for students to present their opinion.

The example of this approach is the survey conducted for the "Methodical aspects of engineer's activity" course intended for first-semester students of the Internet of Things Engineering undergraduate degree programme offered at the Faculty of Electronics and Information Technology. The objective of the survey and sharing experience with using results of similar surveys carried out in previous years were explained by the teacher in class. Following that, a comprehensive on-line questionnaire (20 questions on this specific course and the entire curriculum) was filled out at home by almost all students (return rate of 90% was achieved) and the group of ca. 20 students provided more than 10 pages of comments on various issues related to the closed questions. The complete outcome of the survey (anonymised and randomised) was made available to the students, so that they could see the opinions (incidentally, quite diversified) of their peers. This is perceived by students as an additional incentive to take part in future surveys.

9.5. Suggested scenario

The scenario presents a **discussion** of the results of questionnaires with the participation of students.

9.5.1. Overview

The scenario describes a joint discussion of the results of the anonymous feedback submitted by the participants of a course. Its aim is the continuous development of the course, taking into account the development of science and the changing needs of students.

9.5.2. Objectives

The purpose of the meeting is to discuss the results of the questionnaires received from students constructively. The concrete proposals for changes and modifications to the course, jointly agreed by the team of teachers conducting the course, alumni and future participants should be the result of this discussion.

9.5.3. Target participants

- A moderator: a person not related to the course (e.g. a student, a doctoral student or a professor)
- Students:
    - alumni of a course,
    - potential future participants of the course,
- The team of teachers.

9.5.4. Format

A moderated discussion.

9.5.5. Duration

Suggested duration: 90-120 minutes

9.5.6. Resources

- The opinions from the questionnaires, categorized in terms of similarities.
- A projector.
- A whiteboard and markers.

9.5.7. Description

At the beginning of the meeting, the moderator should present the students' opinions (possibly selected). They should be divided into categories, e.g. proposed changes to the lecture, new ways of assessment, etc.

Each category should be jointly discussed in terms of relevance, feasibility, required resources to implement, etc. Implementation of each category may require time, resources, syllabus changes, arrangements with university authorities, and more.

After a joint selection, it is necessary to make a proposal (the team of teachers) on which changes to implement and when it can be possible.

Acknowledgements

Acknowledgements

References and supplementary materials

[1] Bergmark, Ulrika, and Susanne Westman. "Co-creating curriculum in higher education: Promoting democratic values and a multidimensional view on learning." *International Journal for Academic Development* 21.1 (2016): 28-40.

[2] Björklund, Tua, et al. *Passion-based co-creation*. Aalto University, 2017.

[3] Bovill, Catherine, et al. "Experiences of learning through collaborative evaluation from a masters programme in professional education." *International Journal for Academic Development* 15.2 (2010): 143-154.

[4] Bovill, Catherine, and Catherine J. Bulley. "A model of active student participation in curriculum design: exploring desirability and possibility." (2011): 176-188.

[5] Bovill, Catherine. "An investigation of co-created curricula within higher education in the UK, Ireland and the USA." *Innovations in Education and Teaching International* 51.1 (2014): 15-25.

[6] Bovill, Catherine, et al. "Addressing potential challenges in co-creating learning and teaching: Overcoming resistance, navigating institutional norms and ensuring inclusivity in student–staff partnerships." *Higher Education* 71.2 (2016): 195-208.

[7] Bovill, Catherine, and Cherie Woolmer. "How conceptualisations of curriculum in higher education influence student-staff co-creation in and of the curriculum." *Higher Education* 78.3 (2019): 407-422.

[8] Bovill, Catherine. "Co-creation in learning and teaching: the case for a whole-class approach in higher education." *Higher Education* 79.6 (2020): 1023-1037.

[9] Buckley, Alex. "How radical is student engagement? (And what is it for?)." *Student Engagement and Experience Journal* 3.2 (2014): 1-23.

[10] Cook-Sather, Alison. "Listening to equity-seeking perspectives: how students' experiences of pedagogical partnership can inform wider discussions of student success." *Higher Education Research & Development* 37.5 (2018): 923-936.

[11] Deeley, Susan J. "Summative co-assessment: A deep learning approach to enhancing employability skills and attributes." *Active Learning in Higher Education* 15.1 (2014): 39-51.

[12] Delpish, Ayesha, et al. "Equalising voices: Student-faculty partnership in course design." *Engaging student voices in the study of teaching and learning* (2010): 96-114.

[13] Dunne, Elisabeth, et al. "Students as change agents: New ways of engaging with learning and teaching in higher education." (2011).

[14] Howson, Camille Kandiko, and Saranne Weller. "Defining pedagogic expertise: Students and new lecturers as co-developers in learning and teaching." *Teaching & Learning Inquiry* 4.2 (2016): 50-63.

[15] Huxham, Mark, et al. "'Observation has set in': comparing students and peers as reviewers of teaching." *Assessment & Evaluation in Higher Education* 42.6 (2017): 887-899.

[16] Knaggs, Angie, et al. "Partnership status: It's complicated. Reflections on the "undiscussables" in a student-staff partnership." *International Journal for Students as Partners* 5.1 (2021): 131-137.

[17] Lubicz-Nawrocka, Tanya. "Co-creation of the curriculum: Challenging the status quo to embed partnership." *The Journal of Educational Innovation, Partnership and Change* 3.2 (2017).

[18] Luescher-Mamashela, Thierry M. "Student representation in university decision making: good reasons, a new lens?" *Studies in Higher Education* 38.10 (2013): 1442-1456.

[19] Marquis, Elizabeth, et al. ""I feel like some students are better connected": Students' perspectives on applying for extracurricular partnership opportunities." *International Journal for Students as Partners* 2.1 (2018): 64-81.

[20] Mihans, Richard, Deborah Long, and Peter Felten. "Power and expertise: Student-faculty collaboration in course design and the scholarship of teaching and learning." *International Journal for the Scholarship of Teaching & Learning* 2.2 (2008).

[21] Pantoja Díaz, Odette, Gabriela Ribes-Giner, and María Rosario Perello-Marin. "The impact of co-creation on the student satisfaction: Analysis through structural equation modeling." *Abstract and Applied Analysis*. Vol. 2016. Hindawi, 2016.

[22] Rock, R., E. Foster, and S. Lamb. "Putting students at the heart of the curriculum change process." *York: Higher Education Academy* (2015).

[23] Werder, C., and M. M. Otis. "Not the conclusion: Moving from engaging to sustaining student voices." *Engaging student voices in the study of teaching and learning* (2010): 185-194.