

Successful Design of Student-Centered Learning and Instruction (SCLI) Ecosystems in the European Higher Education Area

A keynote at the XX Anniversary of the Bologna Process

Manja Klemenčič

Department of Sociology, Faculty of Arts and Sciences, Harvard University

33 Kirkland Street, Cambridge 02138 MA, USA

Corresponding author: manjaklemencic@g.harvard.edu

Abstract: *Implementation of student-centered learning and instruction (SCLI) environments has been a repeatedly affirmed objective in the European Higher Education Area (EHEA). Yet, the implementation of SCLI has been hampered by the ambiguities in the definition of SCLI, its key elements and the indicators to demonstrate presence of SCLI in an institution. Recognizing the problems with implementation of SCLI in EHEA, this keynote first discusses the key misconceptions of SCL and submits that framework for SCLI ecosystems by indication the key elements and the indicators at the institutional and departmental level. The keynote draws on the author's prior work on SCL policies in the EHEA and the contributions to the forthcoming Routledge Handbook on Student-Centered Learning and Instruction in Higher Education edited by Sabine Hoidn and Manja Klemenčič.*

Keywords: Flexible Learning Pathways; Learning Support; Student-Centered Learning and Instruction; Student-Centered Learning Spaces and Infrastructure; Teaching Support

Introduction

This keynote begins with good news. The EHEA policies on SCLI capture the essential elements of SCLI environments recommended by scholarship. In EHEA policies, SCLI is firmly linked to the learning outcomes, including the competences needed in changing labor markets and the competences for active and responsible citizenship in democratic societies. EHEA policies mention the importance of effective support and guidance structures for SCLI, including professional development opportunities for higher education teachers. Since Paris Communique (2018), SCLI is also linked to flexible learning pathways in the context of lifelong learning. The European Standards and Guidelines for Quality Assurance in the EHEA include several standards specifically addressing student-centered learning, teaching and assessment, in particular 1.3 stating that “[in]stitutions should ensure that the programmes are delivered in a way that encourages students to take an active role in creating the learning process, and that the assessment of students reflects this approach.” (ESG 2015, 1.3), as well as the related standards on learning resources and student support (ESG 2015, 1.6), and teaching staff (ESG 2015, 1.5). Furthermore, the EU’s renewed modernization agenda highlights the importance of work-based learning and activities involving real-world problems, as well as the role of technology in enabling the flexible and individualized learning pathways.

The problem with the existing policies is, however, as European University Association (EUA)

researchers Gover and Loukkala (2018, p. 24 cited in Dakovic and Zhang forthcoming, p. 9) point out, that “across institutions and countries, there is still a lack of formalized definition or common approach to SCL” and “there is no common understanding of what features or indicators would demonstrate the presence of SCL at institutions, even when institutions do implement SCL, and internal policies are explicit on the need for SCL.”¹ Similarly, European Students’ Union (ESU) researchers suggest that studies conducted by ESU show that “the implementation of SCL in practice is lacking” (Šušnjar and Hovhannisyan forthcoming, p. 2).² In short, a visible shift to SCLI in EHEA has been hampered by the fragmented mention of SCLI across EHEA policies and instruments, the lack of an overarching EHEA policy framework for SCLI along with the ambiguities in the definition of SCL, its key elements and the indicators to demonstrate presence of SCLI in an institution (Klemenčič 2017).³

In the present situation, any higher education institution can likely comply with the EHEA/ESG guidelines on SCLI by showing evidence of some SCLI practices in selected courses, some academic advising, some flexible learning pathways, some internal policies demonstrating intention to implement SCL, etc. However, in most institutions we have not witnessed a general shift to SCLI environments. Often SCLI is merely a catchphrase in the course design documents or the study program self-evaluation reports or a reference merely to the teaching method (McKenna and Quinn forthcoming)⁴ rather than a comprehensive framework and indeed a culture permeating all educational processes at the higher education institution. This keynote argues that for institutions to make such a “paradigm shift” to SCLI the institution has to develop an overarching framework, indeed a **student-centered learning and instruction ecosystem as an interactive system of multiple key elements** centered around the study programs and their courses in which the student-centered instructional practices are designed for the purpose of activating and deepening learning towards the expected learning outcomes (see Figure 1 below).

Some of the most noted high-impact student-centered instructional practices are mentioned when discussing misconceptions, but broadly they encompass **active learning activities** (i.e., activities that all students in a class session are called upon to do other than simply watching, listening and taking notes of the lecture) and that are involve higher-order cognitive activities (such as questioning, problem-solving), **collaborative learning activities** (i.e., activities that prompt students to working in pairs or groups on an assignment or project leading to a final product whereby each student individually is held accountable for doing their share of the work), **experiential learning activities** (i.e., activities that engaged students in doing some educationally-purposeful work and reflecting on the experience of doing that work), and **self-regulated learning activities** (i.e., activities that strengthen students’ learning autonomy).

Other elements of SCLI ecosystems include: **learning support** (i.e., academic advising to students); **teaching support** (i.e., professional development opportunities and mentorship to teaching staff as

¹ Dakovic, G. and T. Zhang (forthcoming in Spring 2020) Student-Centered Learning from a European Policy and Practice Perspective. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

² Šušnjar, A. and G. Hovhannisyan (forthcoming in Spring 2020) Bridging the Policy-Practice Gap: Student-Centered Learning From the Students’ Perspective. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

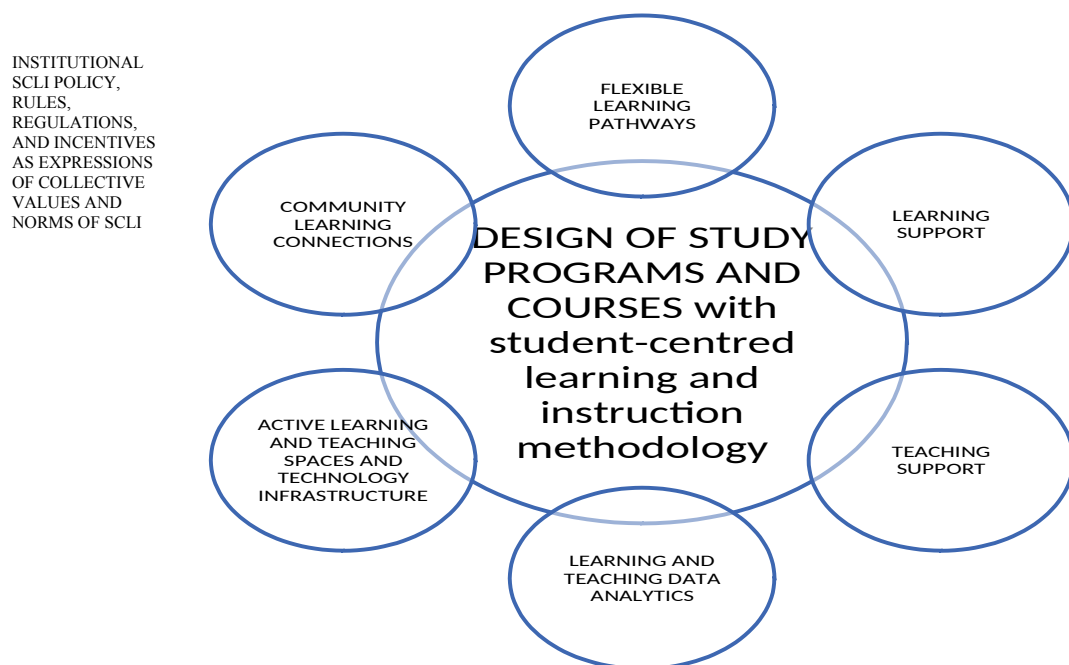
³ Klemenčič, M. (2017) From Student Engagement to Student Agency: Conceptual Considerations of European Policies on Student-Centered Learning in Higher Education. *Higher Education Policy* 30(1): 69-85.

⁴ McKenna, S. and L. Quinn (forthcoming in Spring 2020) Misapplications of Student-Centered Approaches. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

well training for graduate students and undergraduate teaching assistants); **active learning spaces and learning (technology) infrastructure** (active learning classrooms: student-centered libraries, laboratories, studios, academic technology support); **community learning connections** (intra-institutional partnerships with research, entrepreneurship and outreach functions as well as educational partnerships with local community actors); **teaching and learning data analytics** (for quality assurance purposes); and **flexible learning pathways** (broadening the curriculum to include elective courses, allowing for more flexible entry routes to the study programs, flexible delivery modes through part-time, distance and e-learning provision and broadening the curriculum to include elective courses, interdisciplinary courses, interdisciplinary study programs, etc.). These elements are enabled with institutional SCLI policy, rules and regulations, initiatives and institutional norms and values that reward and incentivize SCLI practices across the institution.

In short, the student-centered learning and instruction ecosystems in EHEA is an interactive system of multiple elements supporting the design and the implementation of study programs and courses based on SCLI methodology. It is premised on the existence of SCLI institutional policy, rules, regulations and incentives which reflect the collective values and norms on SCLI. This ecosystem allows for interactions between the multiple and intertwined learning communities – within each course, course-based projects, advising or peer tutoring groups, study programs, multiple related study programs, research and entrepreneurship labs, etc. – that comprise of internal stakeholders – students, teaching staff, relevant administrators, researchers, etc. as well as their educational partners from outside communities, i.e., industry, government, nonprofit organizations, etc.

Figure 1 Student-centered learning and instruction ecosystems in EHEA



Recognizing the problems with the implementation of SCLI in EHEA, the keynote first discusses and refutes the common misconceptions of SCLI. Next it lists the key indicators for evaluation of SCLI at the level of a higher education institution and within study programs. The keynote draws on the author’s prior work on SCL policies in the EHEA (Klemenčič 2017) and the contributions to the forthcoming Routledge Handbook on Student-Centered Learning and Instruction in Higher Education

edited by Sabine Hoidn and Manja Klemenčič (forthcoming).⁵

Misconceptions of SCLI and steps towards successful deigning of SCL ecosystems

(1) Scholars, such as McKenna and Quinn (forthcoming) argue that policy deliberations on SCLI are particularly prone to misconceptions because pedagogical approaches are introduced as a corrective of existing practices **yet the institutional culture underlying these practices remains unchanged**. Indeed, the higher education institutions and their departments have robust sets of collective values, traditions and narratives of learning-teaching processes that shape and are shaped by student and teachers' identities, and in turn impact students' and teachers' agency and their interactions in teaching and learning environments. Implementation of SCLI, therefore, necessarily involves exploring both collective values and personal beliefs of teachers and students and how these interact with the principles of SCL. As ESU suggests, SCLI is not only a set of teaching-learning practices, but is "both a mindset and a culture within a given higher education institution" (*ESU 2013, p. 3 cited in Šušnjar and Hovhannisyan forthcoming, p. 12*).

Exploring students' and teaching staff values on teaching-learning can be conducted through an internal survey or focus group meetings or as part of the deliberations developing new institutional and departmental policies on SCLI. In the next step, these collective values and collective narratives have to be adjusted to align with the principles of SCLI. Changing institutional culture, if of course, not easy or quick. Inclusive process of drafting new institutional and departmental policies and guidelines for implementation of SCLI is one important step in this direction. Students, teaching staff and administrative teaching and learning support staff should be involved in drafting the policies and guidelines. The more inclusive the process and the more open to the input from the departments, the better chances it has to result in successful implementation. Institutional policy and guidelines provide a framework for the preparation of the departmental policies and guidelines.

Merely new policies and guidelines for implementation, even if drafted through an inclusive policy process, often do not suffice for a necessary change in institutional culture. To bring about cultural change, institutional leaders need to consider a long-term public relations campaign that will signal the institutional values on SCLI, justify and explain the elements of SCLI ecosystem, and showcase the internal examples of impactful and innovative SCLI practices. Such a campaign can involve articles in the institution's magazine, public news outlets, and student newspapers; posters, videos, T-shirt and other promotional activity showing institutional commitment to SCL; designated annual SCLI days to recognize most impactful SCLI practices, such as in the libraries or academic technology or academic advising or stellar teachers, teaching fellows and undergraduate teaching assistants, organize professional development workshops, etc.

(2) Another common misconception of SCLI is that **there exist teaching practices that can and should be universally applied**, that is without consideration of the disciplinary knowledge as part of the expected learning outcomes or without consideration of type of the course (foundational vs specialized) or without consideration of size of the course (mass lecture course or a small seminar). SCLI policies and practices are often discussed as generic pedagogical tools removed from the disciplinary knowledge and the expected learning outcomes. Such design of SCLI policies, "obscures

⁵ Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

the ways in which students are transformed by their engagement with knowledge, second it obscures the importance of the expertise of teachers in designing an environment that provides students with access to knowledge, and third it obscures the role of educational institutions in providing a context in which this transformation can take place” (Ashwin forthcoming, p. 1).⁶ It is therefore necessary that the design of the aforementioned elements of SCLI ecosystem is centered around the design of the study programs and the individual course design. This is to ensure that the ultimate purpose of SCLI is achieved that is to activate student learning, to help students to achieve and exceed the expected learning outcomes defined as “...statements of what the individual knows, understands and is able to do on completion of a learning process” (ECTS Guide 2015, p.10).

Tuning Project has assisted institutions within EHEA (and beyond) towards reforms of study programs based on definition of study program profile and learning outcomes, and the Tuning Methodology also requires to define approaches to teaching, learning and assessment. However, the aforementioned perceptions of uneven or lack of implementation of SCL point to weaknesses in this area. So how to achieve this? Of each study program and of each course must be expected to justify the teaching and learning methodology for achievement of expected learning outcomes in the same way as researchers are expected to describe research methodology by which they expect to come to research findings. Such teaching-learning methodology has to explain how the different elements of SCLI are applied and why.

Over the past 20 years of the Bologna Process, we have witnessed across EHEA higher education institutions unprecedented reforms of the study programs following the policy recommendations on the European Credit Transfer System and European Qualifications Frameworks (Wagenaar 2019).⁷ These reforms have shown that European-led initiatives can bring about visible changes in how higher education institutions conduct their study programs; even if the reform processes were not without challenges and often happened at different speeds across countries and institutions. I trust that similar large-scale reform of teaching and learning environments to implement SCLI is possible. As departments and institutions put substantial effort towards designing their study programs with learning outcomes and degree profiles of their graduates in mind, so can departments reassess their teaching, learning and assessment practices and other elements of SCLI ecosystems. Each study program and each course description should include an elaborate description of SCLI methodology specifically designed for that study program and each course in that study program.

SCLI methodology cannot be copy-pasted from one study program to another nor from one course to another. There will be variety of methodologies across study programs reflecting the fact, as suggested by McKenna and Quinn (forthcoming, p. 7) that “[t]he nature of knowledge differs from discipline to discipline. Disciplines vary along multiple lines: from how reality and truth are understood to how arguments are built, from the types of evidence that are considered valid to the ways of writing that are required for communicating knowledge, and so on.”

Furthermore, each study program follows a careful sequence of courses applying logic of scaffolding to guide students from more directed instruction in foundational courses progressively towards more

⁶ Ashwin, P. (forthcoming in Spring 2020) How Student-Centred Learning and Instruction Can Obscure the Importance of Knowledge in Educational Processes and Why it Matters. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

⁷ Wagenaar, R. (2019) Reform! TUNING the Modernisation of Higher Education in Europe. A Blueprint for Student-Centered Learning. University of Deusto and University of Groningen: Tuning Academy.

independent learning and independent knowledge construction. Similarly, in each course, the instructors use scaffolding logic to help students progress from basic to deeper understanding and greater learner autonomy. These differences in scaffolding logic also result in differences in SCLI methodologies which have to do with the choices in material, activities, sequencing, etc.

Finally, the contents of study programs as well as teaching-learning processes ought to – at least in some part - reflect the needs and the specific characteristics of the immediate local communities and create opportunities for learning interactions with and within these communities to better equip graduates for working life after they graduate. Undergraduate research work in local communities, project work with local communities, internships, field visits are all excellent examples of impactful community learning interactions. McKenna and Quinn (forthcoming, p. 9) also point out that SCLI approaches can “provide a strong vehicle for connecting students’ lived experiences to powerful disciplinary knowledge” as well as take account of the prior knowledge that students bring with them.

(3) SCLI approaches are often (wrongly) conceived as a **less rigorous teaching learning methodology focused on satisfying and “Edu entertaining” the students-consumer** (McKenna and Quinn, forthcoming). Critiques of SCLI also argue that SCLI **allows student-consumers to make requests and direct the contents and the teaching-learning processes even when at odds with their learning needs** (McKenna and Quinn, forthcoming). I want to make clear that SCLI is not about lowering academic standards to satisfy students. SCLI does not mean that challenging activities and problem-sets need to be removed to keep the student-consumer satisfied. SCLI also does not mean that students should never struggle to accomplish an assignment.

These misconceptions are based on the misinterpretations of the core tenets of SCLI which are:

... reliance upon active rather than passive learning, an emphasis on deep learning and understanding, increased responsibility and accountability on the part of the student, an increased sense of autonomy in the learner, an interdependence between teacher and learner (as opposed to complete learner dependence or independence...), mutual respect within the learner-teacher relationship, and a reflexive approach to the learning and teaching process on the part of both teacher and learner (Lea, Stephenson and Troy 2003, p. 322 cited in McKenna and Quinn, forthcoming).

Or as well-defined in the ECTS Users’ Guide (2015, 15):

“Student-Centred Learning (SCL) is a process of qualitative transformation for students and other learners in a learning environment, aimed at enhancing their autonomy and critical ability through an outcome-based approach. The SCL concept can be summarised into the following elements: i) Reliance on active rather than passive learning; ii) Emphasis on critical and analytical learning and understanding; iii) Increased responsibility and accountability on the part of the student; iv) Increased autonomy of the student; and v) A reflective approach to the learning and teaching process on the part of both the student and the teacher.”

Indeed, SCLI approaches presume more choice for the student over learning-teaching contents, processes and deliverables, but these choices are offered within a carefully designed curricular framework. In other words, there is no free choice, but choice within the course structure defined by the teaching staff with academic expertise in that subject. Furthermore, these choices also presume more

responsibility of the student over his/her learning, self-regulated learning capabilities building towards greater learner autonomy (Hoidn and Reusser forthcoming). Such expectation toward the learner, do not undermine the responsibilities or professional integrity of teachers. Teachers still define the expected learning outcomes and teachers still define the content, the process, the deliverables and the assessment in a given course.

In defining their SCLI course methodology, teachers have to purposefully consider how – through what material, activities, sequencing - student learning will be activated and deepened. Teachers also have to allow enough flexibility in their course methodology that they can adjust it based on student feedback during the course, new information on student prior knowledge or specific needs or interests, and on own reflection on the ongoing teaching-learning process. In addition, teachers have to be aware of the high-impact classroom practices and seek to integrate them – when possible and when meaningful in terms of expected learning outcomes – into their course methodology. SCLI indeed changes the relationships between students and teachers from paternalistic authoritative partnership based on mutual respect and belief that in learning-teaching processes there are shared responsibilities and students and teaching staff in a course all constitute a collective learning community. These relationships are also based on understanding that learning is inherently social process and that students do not only learn from teaching staff, but also from peer students and that teaching staff also learn from students.

There are several high-impact SCLI classroom practices. First, **testing** has also been understood as going against the mindset of SCLI and to be used only to measure learning. There is powerful evidence from research that testing helps learning (Schell and Martin forthcoming).⁸ As argued by Schell and Martin (forthcoming, p. 1), “learning is dramatically enhanced when students retrieve or pull information from their memory, a theoretical principal known as retrieval, or test-enhanced learning.... Examples of evidence-based, student-centered learning outcomes that result from test-enhanced learning include dramatically increased long-term retention of knowledge, improved performance on inferential tasks, increased motivation, increased social-emotional well-being, enhanced ability to transfer learning to novel situations, and engagement in the construction of new knowledge and meaning.” In fact, the authors argue that “using the principle of retrieval-enhanced learning to guide pedagogy in higher education is one of the easiest and most promising ways instructors can deliver student-centered instruction” (ibid.).

Second, **assessment** in SCLI is multifaceted, consisting of assessing and offering feedback on several small (lower-stake) assignments rather than one final high-stake assessment. Furthermore, assessment within SCLI also includes self-assessment/self-quizzing (to activate reflective practice) and peer assessment (to activate peer-to-peer learning) (Motschnig and Cornelius-White forthcoming).⁹ Again, student-centered assessment does not mean that that academic standards are lowered, but that there are several assessment activities throughout the course linked the different aspects of the expected learning outcomes, and that such assessment is not only summative but summative by involving **timely feedback**. In this way students get information on their progress in the course to allow them to adjust

⁸ Schell, J. and R. Martin (forthcoming in Spring 2020) The Powerful Role of Testing in Student-Centered Learning and Instruction in Higher Education. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

⁹ Motschnig, R. and J. H. D. Cornelius-White (forthcoming in Spring 2020) Person-Centered Theory and Practice: Small Versus Large Student-Centered Courses. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

their learning strategies and – if needed – seek support. Similarly, this allows teaching staff to adjust the teaching interventions and support according to individual students’ or student groups’ readiness, progression, prior knowledge and possible gaps in prior knowledge, learning profiles and interest, i.e. engage in **differentiated instruction** (Gheysens, Griful-Freixenet and Strayven forthcoming).¹⁰ **Recognition of prior knowledge** through course-entry assessment or questionnaire is a pre-condition for differentiated instruction and another high-impact SCLI practice.

Third, **technology-supported teaching-learning processes** have also been shown effective not only to offer flexible delivery modes, but also to strengthen contact to student and student engagement (Motschnig and Cornelius-White (forthcoming). Technology-supported SCLI also shows excellent capabilities to bring about more personalized education (‘allowing for student choice in contents and relevance of contents to the individual student’) and individualized education (‘allowing students to work at their own pace and according to their particular learning needs’) education (Langworthy, Shear, & Means, 2010, 111-112 cited in Klemenčič 2017).

Fourth, while research shows that a straight lecturing is far from an effective practice, this does not mean that **lecture** is no longer an acceptable method in SCLI (Hoidn and Reusser forthcoming).¹¹ However, lecturing needs to be modified: broken-up into mini lectures (recognizing students’ **limited attention span**) (Doyle and Doyle forthcoming),¹² multimodal (to allow enable dual coding of information), and to include active learning components, such pair or group work on a problem-sets or work on a prompt with class discussion (McCarty and Deslauriers forthcoming).¹³ As McCarthy and Deslauriers (forthcoming) demonstrate on the case of transforming a mass lecture-based physics class this can happen with a moderate investment of time by the teaching staff, without sacrificing content and with evident improvement in test scores and student attitudes to the course compared to the traditional lecture. Both **collaborative learning** and **peer-to-peer learning** activities are excellently suitable for large lecture classes (Duraisingh forthcoming).¹⁴

Sixth, SCLI approaches seek to overturn the practices which rely on impairing knowledge and insights discovered by others - typically through an uninterrupted lengthy lecture - and then test students’ memories for recall of those insights, a practice popularly referred to as rote learning. SCLI does not mean that we should conduct all teaching-learning processes always and necessarily through experiential learning rather than guided learning. However, SCLI is an umbrella for a number of high-

¹⁰ Gheysens, E., Griful-Freixenet, J. and K. Struyven (forthcoming in Spring 2020) Differentiated Instruction as a Student-Centered Teaching Approach in Teacher Education. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

¹¹ Hoidn, S. and K. Reusser (forthcoming in Spring 2020) Foundations of Student-Centered Learning and Instruction. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

¹² Doyle, T. and B. M. Doyle (forthcoming in Spring 2020) Learning and Teaching in Harmony with the Brain: Insights from Neuroscience, Biology, Cognitive Science and Psychology. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

¹³ McCarthy, L. and L. Deslauriers (forthcoming in Spring 2020) Transforming a Large University Physics Course to Student-Centered Learning, Without Sacrificing Content: A Case Study. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

¹⁴ Duraisingh, E. A. (forthcoming in Spring 2020) Promoting Engagement, Understanding, and Critical Awareness: Tapping the Potential of Peer-to-Peer Student-Centered Learning Experiences in Higher Education. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

impact approaches to help activate and deepen student learning, such as different forms of experiential learning: **inquiry based learning** (research-based and research-tutored practices are widely considered high-impact SCL practices) (Struthers and Van Arsdale forthcoming),¹⁵ and project-based learning. Study programs should be expected to offer such types of experiential learning opportunities to students. Again, it might not be suitable for every course to have an experiential learning component, but within the entire study program, there must be many courses based on experiential learning.

Seventh, high-impact classroom practices also include helping students to become self-regulated and thus more autonomous life-long learners. **Self-regulated learning** means that students continually reflect on their own learning process and when needed adjust their learning strategies (Hoidn and Reusser forthcoming). Classroom practices that invoke and strengthen self-regulation include entry-point assessment for prior knowledge and gaps in prior knowledge, low-stake assessments, self-quizzing and reflection prompts. In brief, in a course, teaching staff need to help students define their personal learning goals, plan their learning strategies and reflect in meeting these goals and possible needs to adjust their strategies. There exist various activities to activate reflection on own learning, such as reflective journaling (private or public) and purposeful reflection on group work activity or on experiential learning activity, such as conducting research for a research paper.

Key indicators of presence of SCLI at the institutional level:

- Comprehensive institutional policy and guidelines on excellence in teaching and learning – committed to SCLI including:
 - Rules and regulations on hiring, promotion, remuneration, workload and professional development of academic teaching staff
 - Provisions on hiring, remuneration, workload and training of graduate students and undergraduate teaching assistants
 - Financial and symbolic incentives for educational innovation and course development by purposefully integrating the elements of SCLI ecosystem
 - Educationally-purposeful internships, paid work and volunteer opportunities for students at the institution¹⁶
 - Student involvement in institutional governance bodies responsible for policy decisions on SCLI
 - Student involvement in internal QA units responsible for SCLI¹⁷
 - Student rights office and student complaints procedures
 - Develop flexible learning pathways
 - Strong academic integrity and commitment to ethical behavior in education processes (e.g. a student-teachers body to review cases of plagiarism and other violations)

¹⁵ Struthers, D'Reen and R. Van Arsdale (forthcoming in Spring 2020) The Connected Curriculum Framework: Case Study of University College London. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

¹⁶ Klemenčič, M. (2018) *Students in service to their universities - Student campus employees*. Lecture at Culture and Analysis Workshop, Harvard University.

¹⁷ Klemenčič, M. (2018) The student voice in quality assessment and improvement. In Ellen Hazelkorn, Hamish Coates and Alex McCormick (eds.) *Research Handbook on Quality, Performance and Accountability in Higher Education*, pp. 332-343 (Edward Elgar Publishing).

- Internal quality assurance – evaluation of SCLI¹⁸
 - Learning and Teaching Data Analytics for reporting and evidence-based decision-making¹⁹
- Learning technology infrastructure to support SCLI²⁰
- Student-Centered Libraries²¹
- Redesign of spaces for active learning²²
- Academic support to students, including peer tutoring, online tools on self-study skills, self-regulated learning, foreign language tools, computer-based self-paced courses in introductory mathematics, statistics, etc.²³
- (Unit for) teaching advancement and instructional support²⁴
 - repository of high-impact classroom practices, repository of course syllabi
 - individual consultations, professional development workshops
- Research and entrepreneurship labs and community learning connection partnerships²⁵

¹⁸ Kember, D. (forthcoming in Spring 2020) Implementing a University-Wide Evaluation System to Promote Student-Centered Learning. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

¹⁹ Toeteneel, L. and B. Rienties (forthcoming in Spring 2020) The virtuous circle of learning design and learning analytics to develop student centred online education. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

²⁰ Kessler, A. and S. Robinson (forthcoming in Spring 2020) Flipping the delivery of course content in an advanced physics lab setting. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

²¹ Vedantham, A. (forthcoming in Spring 2020) Student-Centred Libraries: Changing Both Expectations and Results. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

²² Finkelstein, A. and L. Winer (forthcoming in Spring 2020) Active Learning Anywhere: A Principled-Based Approach to Designing Learning Spaces. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

²³ Revuluri, S. (forthcoming in Spring 2020) Student-Centered Learning and Instruction – Lessons From Academic Support. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

²⁴ Brenner, T.J., Beaver, A., Kuzmick, M., Pollock, P. and R. A. Lue (forthcoming in Spring 2020) Partners in Creating Student-Centered Learning: Case Study of the Derek Bok Center for Teaching and Learning. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

²⁵ Struthers, D'Reen and R. Van Arsdale (forthcoming in Spring 2020) The Connected Curriculum Framework: Case Study of University College London. In Hoidn and Klemenčič (eds.) *Routledge Handbook on Student-Centered Learning and Instruction in Higher Education*. Routledge.

Key indicators of presence of SCLI at the departmental/study program level:

- Comprehensive departmental policy and guidelines on excellence in teaching and learning – commitment to SCLI including:
 - Rules and regulations on hiring, promotion, remuneration, workload and professional development of academic teaching staff
 - Provisions on hiring, remuneration, workload and training of graduate students and undergraduate teaching assistants
 - Financial and symbolic incentives for course development by purposefully integrating the elements of SCL ecosystem
 - Internships and paid and volunteer opportunities for students at the department
 - Student involvement in departmental/study program governance bodies responsible for policy decisions on SCLI
 - Student involvement in internal QA units responsible for SCLI
 - Student rights office and student complaints procedures
 - Develop flexible learning pathways
 - Strong academic integrity and commitment to ethical behavior in education processes (e.g. a student-teachers body to review cases of plagiarism and other violations)
- Internal quality assurance – evaluation of SCL
 - Departmental learning and teaching data analytics
- Review of curricular design for each study program to address and report SCL methodology including elements of SCL ecosystem
 - SCL methodology reported in each course
- Departmental professional development of all teaching staff and teaching mentorships
- Pool of graduate and undergraduate student course fellows/assistants and training for graduate teaching fellows and undergraduate teaching assistants
- Collective departmental development and sharing of high-impact classroom practices
- Repository of course syllabi and course material
- Number of spaces available for active learning
- Departmental academic advising – learner support
- Explicit departmental links to institutional support from libraries, learning technology, learning support – academic advising, instructional support and transparency of these resources available to students and teaching staff.

Conclusion

Scholarship on SCLI offers ample evidence of the superior effectiveness of student-centred classroom practice to activate and deepen student learning (Hoidn and Klemenčič forthcoming). As discussed earlier, there is no single formula of SCLI practice that works for every course and for every study program. The SCLI methodology for each course and each study program is developed with expected learning outcomes in view, with consideration of who the students are (their prior knowledge, learning styles and needs, interests), the specific teaching-learning situation (size of the course, classroom design, etc.) and with enough in-built flexibility that adjustments can be made based on feedback from students and ongoing reflection. The basic principles of SCLI are, however, universal:

- of explicit purpose of activating and deepening student learning by defining meaningful learning outcomes and designing processes and deliverables for students to achieve and even exceed these learning outcomes;
- of mutual respect and collaborative partnership between students and teaching staff in the inherently social pursuit of learning and teaching within the collaborative learning community (of a course or a course project or a study program, etc.);
- of strengthening student agency in the learning-teaching processes by creating inclusive classroom
- of promoting reflective practice among students to become self-regulated learners and develop greater learner autonomy for lifelong learning.

SCLI is not only about classroom practices. Other elements have to be in place within a higher education institution to create a truly student-centred environment and to support and reinforce SCLI classroom practices: learning and teaching support, active learning spaces and learning technology infrastructure, flexible learning pathways, learning and teaching data analytics and community learning partnerships. We can think of these elements as gears that reinforce – bring power – from one elements to another within the same system; all with the purpose to activate and deepen student learning within each course and the entire study program.

SCLI policy framework and guidelines need to be developed by the institutional leadership to create such an SCLI ecosystem. Process of developing such policies and guidelines has to be inclusive to reflect the views of teaching staff, students, relevant administrators and external stakeholders. As discussed earlier, for a real change in institutional culture – norms, values, narratives on teaching and learning – towards SCLI principles, a purposeful long-term SCLI campaign might be needed in addition to SCLI policies.

Finally, SCLI ecosystem cannot be established in an academic environment which is not **fully committed to the highest standards of academic integrity and ethical behaviour**. Breaches of such standards by, for example, tolerating plagiarism, cheating on exams, etc., undermine and hamper implementation of SCLI. As part of the implementation of SCLI ecosystems, higher education institutions have to revise and strengthen their policies, procedures and institutional bodies responsible for preventing and sanctioning unethical behaviour in educational processes. Teachers have to be aware of the ways to prevent (for example, by showing standard citation practices, designing new problem sets for exams rather than recycling them, avoiding rote learning practices, etc.) and to sanction breaches of academic integrity.