OpenVM MOOCs: a design for self-regulated learning

OpenVM MOOC: un diseño para el aprendizaje autorregulado

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Abstract

This paper presents the design of two miniMOOCs (Massive Open Online Courses) developed in the Open Virtual Mobility (VM) MOOC. The OpenVM MOOC is aimed at developing Virtual Mobility skills in higher education students. The design is based on diverse concepts and all the MOOC elements were designed to support SRL. From a descriptive and quantitative approach, the research aims to explore participants' satisfaction and their perception on the supporting roles of the miniMOOC for SRL. Data was collected through an online survey through which 375 answers were collected. Results show the general satisfaction of learners with the MOOC design. As for the SRL design gamification and visualization of pathways were more relevant for certain SRL phases such as monitoring learning. OER and related quizzes were useful for all SRL phases. Quizzes especially supported self-reflection. Open Badges supported the forethought phase of SRL. Social elements such as forums and eportfolios obtained the lowest rates in relation to support of SRL. The paper concludes with recommendations for educational research and MOOCs design.

Keywords: self-regulated learning; MOOC; virtual mobility

Resumen

Este trabajo presenta el diseño de dos miniMOOCs (Cursos Online Masivos y Abiertos) desarrollados en el MOOC Open Virtual Mobility (VM). Este tiene como objetivo desarrollar las habilidades de Movilidad Virtual en los estudiantes de educación superior. El diseño se basa en varios conceptos y todos los elementos fueron concebidos para apoyar el aprendizaje autorregulado. Desde un enfoque descriptivo y cuantitativo, la investigación pretende explorar la satisfacción de los participantes y su percepción sobre las funciones de apoyo al aprendizaje autorregulado. Los datos se recogieron a través de una encuesta en línea a través de la cual se recogieron 375 respuestas. Los resultados muestran la satisfacción general de los alumnos con el diseño del MOOC. En cuanto al diseño para el aprendizaje autorregulado, la gamificación y la visualización de los itinerarios fueron más relevantes para fases la monitorización. Los REA y los cuestionarios fueron útiles para todas las fases. Los cuestionarios apoyaron especialmente la autorreflexión. Las Insignias Abiertas apoyaron la fase de planificación. Los elementos sociales como los foros y los portafolios electrónicos obtuvieron los índices más bajos en relación con el apoyo al aprendizaje autorregulado. El artículo concluye con recomendaciones para la investigación educativa y el diseño de MOOCs.

Palabras clave: *aprendizaje autorregulado; MOOC; movilidad virtual.*

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1. INTRODUCTION: HOW TO SUPPORT VIRTUAL MOBILITY SKILLS IN MOOCs

In the last years, the concept of «Virtual Mobility» has receiving a growing attention from educational policy makers and institutions, because it has the potential to make more accessible and effective students and teachers' mobility in Higher Education (Poce, 2020) Teresevičienė and colleagues (2011) define virtual mobility as an activity or a form of learning, research and communication and collaboration, based on the cooperation between higher education institutions from different backgrounds and cultures working and studying together through an ICT supported learning environment. The main purposes of virtual mobility are knowledge exchange and the improvement of intercultural competences. Despite the potential advantages, Virtual Mobility programs require participants to have good levels of transversal and digital skills to successfully be completed (Poulová et al, 2009). Rajagopal and Firssova (2018) recently identified 8 transversal knowledge and skills necessary to be involved in a Virtual Mobility experience, by applying a group concept mapping methodology and involving 49 experts in the domains of virtual mobility and/or open education with experience in higher education as university professors or education management and support: (1) Intercultural Skills; (2) Collaborative learning; (3) Autonomy-driven learning; (4) Networked Learning; (5) Media and Digital Literacy; (6) Active Self-Regulated Learning; (7) Open-mindedness; (8) Knowledge of Virtual Mobility and Open Education. Based on this classification a Massive Open Online Course (MOOC) named OpenVM MOOC was designed to support participants in a virtual mobility experience to develop pivotal skills to achieve their learning goals. The OpenVM MOOC was developed in the Erasmus+ strategic partnership Open Virtual Mobility[1] (2017-2020). It is an online learning environment for achievement, assessment, and recognition of virtual mobility skills. MOOCs are now being considered and applied by many institutions around the world as a valid internationalization instrument (Knight, 2014). Having said that, engagement and completion rates belong to major challenges in the design of MOOCs. Literature has identified different factors related to MOOCs dropout which can be classified into intertangled categories:

1) Course design (Colman, 2013) which includes little interaction with other learners and instructors, too little personalisation of instruction (Gütl et al., 2014) and course length (Jordan, 2015);
2) Learners personal features which includes motivational aspects, accomplishment perceptions (Khalil & Ebner, 2014), engagement (Kizilcec et al., 2013) and students' lack of self-regulated learning (SRL) skills (Pérez-Alvarez et al., 2016).

MOOCs designers should consider together course design and students' personal disposition toward learning.

In the project OpenVirtual Mobility micro-learning was adopted as an approach for MOOC design which can support students' SRL skills, as personal disposition toward learning. The

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[1] https://www.openvirtualmobility.eu

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microlearning design was introduced in previous work by Buchem et al. (2019) and in this current article we are presenting its design and assessment in terms of SRL.

The article describes the case study of two miniMOOCs (Massive Open Online Courses) Autonomy-driven learning and SRL, which are two out of eight MOOCs designed and implemented in the Open Virtual Mobility (OpenVM) MOOC, specifically aimed at supporting SRL related skills.

In the introductory part of this article, the concepts of SRL will be discussed. Then, the approach applied to the design of the MOOCs will be described. Results from the pilot evaluation conducted with students from diverse universities in Europe will be presented to provide recommendations for future research with focus on SRL as a design approach in MOOCs.

2. SELF-REGULATED LEARNING IN MOOCs

SRL was described by Zimmerman (2002) as a cyclical process composed of three phases and six sub phases (see Table 1).

1) "Forethought phase", in which metacognitive tasks are performed before learning. It is described with two sets of processes: a) task analysis and b) the self-motivation beliefs (Littlejohn et al, 2016). Although motivation tends to decrease during the MOOC duration, research has observed that students who were intrinsically motivated for learning and were aimed at achieving accreditation badges experienced little motivation decrease (Haug et al., 2014)

2) "Performance phase", which includes c) metacognitive tasks and d) self-observation. Littlejohn et al. (2016) observed that highly self-regulated learners deployed more flexible and non-linear strategies in MOOCs than those with lower SRL skills. Another recent research has observed that students with higher level of SRL skills self-control their learning by monitoring performance in MOOC assignments (Alonso-Mencía et al., 2020).

3) "Self-reflection phase", which takes place at the end of learning and is described as a process of e) self-judgment and f) self-reaction. Littlejohn et al. (2016) observed that highly SRL participants used tasks as formative assessment while others used to only refer to summative assessment tasks.

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Table 1. Design principles and MOOC elements for SRL in MOOCs based on the literature review by Lee et al., 2019 (35-37)

SRL phase	Design principles	MOOC elements
Forethought phase including metacognitive tasks to prepare learning	- Setting learning objectives and plans for effective time management - Recommending courses for each learners' level or interest	1) Tasks and activities identification 2) Time allocation 3) Scheduling features
Performance phase including metacognitive tasks during learning	- Learners' preferred contents types (video clips, texts, images, voices) - Records of students' learning activities such as note-taking, searching, downloading, and printing - Rehearing and memorizing - Details about participation in the exercise, discussion, homework - Q&A to overcome problems or solve the problems	MOOC platforms should send reminders, solve potential conflicts and visualize progress.
Self-reflection including Metacognitive tasks to finish learning	- History of certificates or credits with invested time and earned achievement scores - Quantitative and qualitative analysis of learning exercise such as quiz, discussions, and exams for reviewing - Feedback on learning success and failure appropriate for individual learning	MOOC platforms should provide them with reports on their progress on each course and offer an overall progress report

The literature review by Pérez-Alvarez et al, (2016) showed that several MOOCs does not provide concrete information on how their design support SRL skills. They observed that goal-setting, strategic planning, self-motivation, self-monitoring and self-evaluation are the metacognitive processes mostly enhanced in MOOCs. These processes are usually supported through visualization of learning objects, personalized learning paths, and social contexts for collaborative learning. Lee et al., 2019 provide observations about how SRL metacognitive skills have been enhanced in MOOCs (Table 1).

In the OpenVM miniMOOCs some of these core elements -such as hints, pathways, quizzes, forums, ePortfolios and badges- were introduced as affordances for SRL within a micro-learning design. The present research will investigate learners' perception of these elements and their impact on students SRL strategies.

3. DESIGNING SELF-REGULATED LEARNING IN OPENVM MOOCS

The Open Virtual Mobility (VM) MOOC is aimed at developing Virtual Mobility Skills in higher education students. The OpenVM MOOC hosts a set of eight miniMOOCs, including SRL and Autonomy-driven Learning miniMOOCs, which have been piloted to investigate how their

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learning designs can enhance SRL in MOOCs. The concept of miniMOOCs is based on the taxonomy of MOOCs by Pilli & Admiraal (2016) who distinguished eight types of MOOCs, including miniMOOCSs, which are smaller, shorter, and cover less content and fewer skills than traditional MOOCs. As opposed to traditional MOOCs which tend to last four to twelve weeks, miniMOOCs are much shorter and may be split into shorter miniMOOCs to enhance the micro-learning process (Lackner et al., 2015). Each OpenVM miniMOOC is divided into three shorter parts, called subMOOCs, each subMOOC related to one of the three levels, i. e. foundations, intermediate and advances (see Fig. 1). With each miniMOOC broken down into three smaller subMOOCs for one of the three levels, learning pathways can be designed by each learner in an individual way, depending on initial and intended skill level. To assess the initial level of a given skill, each miniMOOC starts with a pre-assessment. Based on the results of the pre-assessment, one of the three levels is proposed to the learner, who can decide to follow the recommended pathway or take an own decision. A granular system of micro-credentials based on Open Badges makes the learning outcomes, i. e. virtual mobility skills, visible and actionable to learners. The visualisation of skills which can be developed and micro-credentials which can be earned aims at supporting learners in selecting miniMOOCs and subMOOCs which best match their individual needs and support learning in a personally meaningful way. Furthermore, micro-learning activities in each subMOOC are aligned with structured micro-content in the form of micro-OER, which are OERs suitable to support micro-learning (Sun et al., 2015).
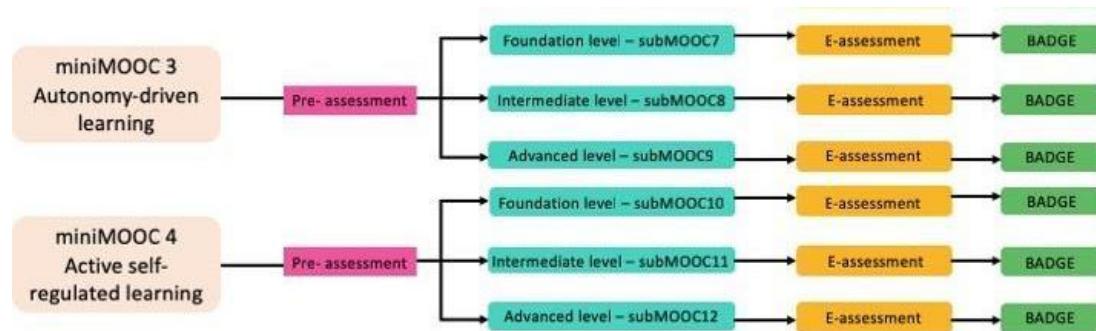

Figure. 1: OpenVM miniMOOCs on Autonomy-driven learning and SRL

The content in the two miniMOOCs is divided into diverse microtasks with OER-based contents in diverse formats, mainly short pieces of text, short (micro) videos and forums for collaborative tasks (Buchem et al, 2019). The micro-learning design of the OpenVM miniMOOCs arises another key challenge for the design and successful learner experience. Since miniMOOC participants need to have a clear map of the possible learning pathways and their convenience for their own learning needs, the quality assurance framework for the OpenVM MOOC has highlighted the need to focus on the pedagogical design of the set of miniMOOCs both for facilitating students personalisation through the diverse learning pathways and for promoting students' SRL skills (Buchem et al., 2018; Tur et al., 2018; Tur et al., 2019). The OpenVM miniMOOCs include several elements aimed at supporting each of the three SRL phases (see Table 2). The design in terms of SRL learning received internal assessment by experts twice, as

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a theoretical design and for the pre-pilot stage, as documented in previous work (Buchem et al., 2018; Tur et al. 2018; Tur et al., 2019).

Table 2: SRL phases in OpenVM mini-MOOCs.

SRL phase	SRL sub-phases	OpenVM design elements
Forethought Metacognitive tasks performed before learning	task analysis self-motivation	MOOC welcome/introduction page Pre-assessment of skills Open Credentials to be earned
Performance Metacognitive tasks during learning	Self-control self-observation	Tasks & SLR prompts in MOOCs OERs in MOOCs incl. quizzes Matching tool for group formation
Self-reflection Metacognitive tasks at the end of the learning process	self-judgement self-reaction	E-assessment and e-portfolio Peer-assessment activities Discussion forums

To support students' metacognitive tasks in the forethought phase, each miniMOOC includes a welcoming message with the presentation of the miniMOOC, initial self-assessment (pre-assessment), description of the aims and learning outcomes and available Open Badges. In order to facilitate learners strategies during the performance phase, each miniMOOC includes an overview of learning contents including OERs, and other guides such as information about the learning path and possible further steps in the miniMOOC pathway, the design of the learning activities, tools for group formation and social learning options. Finally, to support the self-assessment phase, each miniMOOC specifies the assessment activities such as test-based e-assessment, e-portfolio, peer-assessment tasks, and discussion forums. Also, all quizzes offer quick feedback and results visualization to facilitate students' self-control, monitoring and reflecting processes. Furthermore, the OpenVM miniMOOCs design is embedded in the meaningful gamification approach which aims to enhance learner engagement in learning activities through less emphasis on external rewards and more emphasis on learner control and ownership (Buchem & Carlino, 2019). The concept of meaningful gamification builds on research which shows that external rewards, such as scoring-based gamification, tend to enhance short-term motivation and may even have negative effects on self-regulation (Nicholson, 2012). Some of the key elements of meaningful gamification include the user profile with attributes relevant for learning pathways, group formation and visualisation of skills and contributions with digital credentials; possibilities to choose learning pathways such as different miniMOOCs and subMOOCs including the recommendations based on pre-assessment of skills; the visualisation of progress in skill development such as number of subMOOCs taken, e-assessments completed and digital credentials earned; and the use of plugins to support meaningful gamification of the learning design (Buchem & Carlino, 2019). In this way, the learning design approach to OpenVM miniMOOCs utilises a range of pedagogical approaches including SRL and meaningful gamification and focuses not on the hierarchical

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sequence of content presentation but encourages learners to become active co-designers of own learning pathways.

4. METHODS

4.1 Research questions

The present research was aimed at understanding how the OpenVM MOOCs learners assessed the quality of the MOOC main components and to which extent the MOOC supported participants SRL skills. The work is aimed at answering the following research questions:

1. How students generally evaluated the two MOOCs Autonomy Driven Learning and SRL?
2. How students evaluated the learning design of the two MOOCs in terms of SRL?

4.2 Participants

A total of 857 students participated in the two OpenVM miniMOOCs analyzed in this research. We received a total of 375 answers to the questionnaire from participants. Table 3 presents the number of people: 1 participate in the MOOC 2. obtain the badge for successful course completion 3. answer to the final assessment questionnaire. It is noteworthy that most participants attended the foundational courses with success whereas this successful participation decreases for intermediate and advanced levels. The percentage of participants who answer to the final assessment questionnaire (described in detail in the paragraph 4.3) are 68% for the Autonomy Driven Learning MOOC and 63% for the SRL MOOC, respectively.

Table 3. the number of attendees of the Autonomy Driven Learning and SRL MOOCs and who obtains a badge

	Autonomy-driven learning				SRL			
	Users	Badges	Completion Rate	Answers collected	Users	Badges	Completion Rate	Answers collected
Foundation	86	74	86%	80	372	333	90%	257
Intermediate	74	23	31%	52	140	31	22%	99
Advanced	65	4	6%	21	120	71	13%	43
Total	225	101	45%	153	632	365	58%	399

Most of the respondents are female (79,2%) university students (98,1%). Although approximately 57% of participants are younger than 23, more than 23% of participants have more than 31 years.

Table 4: Respondents characteristics

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		Frequency	Percentage
Gender	Female	297	79,2
	Male	76	20,3
	Prefer not to say	2	,5
Role	University student	368	98,1
	Teacher/Trainer/Educator	7	1,9
Age	Less than 20	100	26,7
	Between 21 and 23	114	30,4
	Between 24 and 26	40	10,7
	Between 27 and 30	35	9,3
	Between 31 and 35	31	8,3
	More than 36	54	14,4
Total		375	100

4.3 Data collection and data analysis

Data were collected through a questionnaire submitted after a subMOOC completion. Since this research is aimed at investigating the impact of two specific MOOCs (Autonomy Driven Learning and SRL) on students SRL skills, only students' assessment for these two MOOCs are considered. A total of 375 answers were analyzed out of 1393 total answers received at the MOOC assessment questionnaire. The OpenVM Evaluation Questionnaire is organised in eight sections. In all the sections participants were required to express their level of agreement with a set of statements related to specific MOOC design elements on a Likert scale from 1 (strongly disagree) to 5 (totally agree). OpenVM Evaluation Questionnaire was structured as follow:

1) Personal details: age, gender, affiliation, and role. In this section participants are required to say which of the eight mini-MOOCs they are assessing;
2) Questions regarding the overall MOOC design: learning experience, quality of content instruction and support for learning;
3) Questions regarding digital credentials and meaningful gamification: quality of design, motivation, engagement and possibilities of choice;
4) Questions regarding technical aspects: use and usability;
5) Questions regarding the foundation level of a mini-MOOC: duration, language, content, use of multimedia;
6) Questions regarding the intermediate level of a mini-MOOC: extending questions from the foundation level by questions related to the matching tool and group formation activity, which are specific design elements used at this level;
7) Questions regarding the advanced level of a mini-MOOC: extending questions from the foundation and intermediate levels by questions related to e-portfolio and peer-assessment activities, which are specific design elements at this level;
8) Questions related to the investigation about the extent to which MOOCs supported SRL. In this section participants are required to answer also to open-ended questions.

Within the first 7 sections, transverse questions regarding the MOOCs learning design (e.g. "the length of videos was good for me") and the MOOC support for SRL (e.g. "I learn what I expected from the MOOC") were inserted. Descriptive statistics (average, standard deviation, frequencies) were calculated in order to answer to the above-mentioned research questions.

5. RESULTS

5.1 Learners' general evaluation of the two MOOCs Autonomy Driven Learning and SRL

Comparing the average scores of the two MOOCs, "autonomy-driven learning" received higher evaluation compared to the "SRL" MOOC (Figure 2). However, the general results can be considered satisfactory because average scores are tendentially higher than 3.5 (we used a Likert Scale from 1 to 5, where the median is 3). The Gamification average score in the MOOC SRL is an exception since it received an average score of 3,3. In both the MOOCs, the most appreciated features are 1. Technical features; 2. General evaluation; and the 3. OpenVM bagdes.
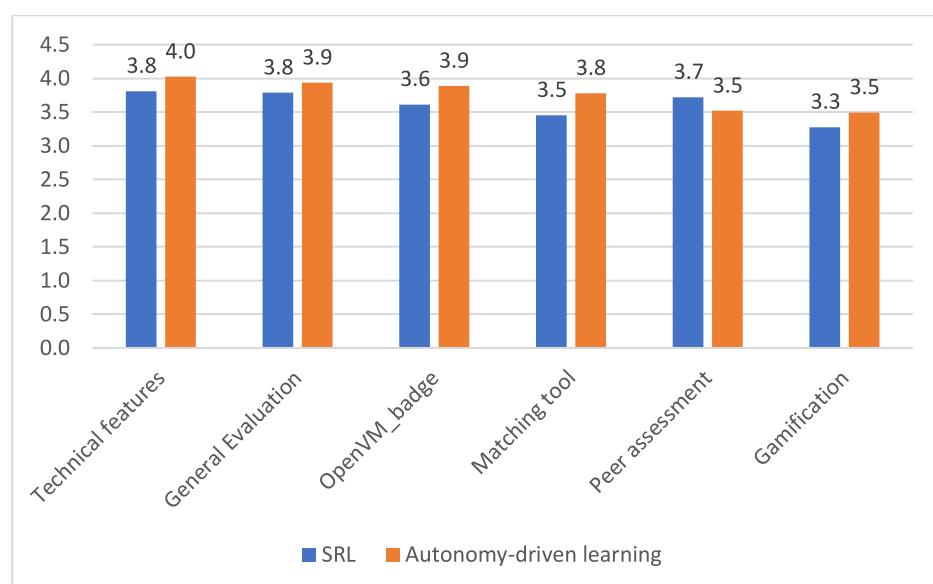
Figure 2 A comparison of the average scores provided by participants to the six dimensions investigated within "autonomy-driven learning" and "SRL" MOOCs.

Comparing the average scores of the general assessment for the three levels within each MOOC (Figure 3), in both the cases the foundation level received a higher score compared to the intermediate and advanced levels. In the "autonomy driven learning" MOOC the advanced level received a higher score compared to the intermediate level, whilst in the SRL MOOC the average scores of the intermediate and advanced levels are similar. As before, general results are satisfactory because average scores are always higher than 3.5.
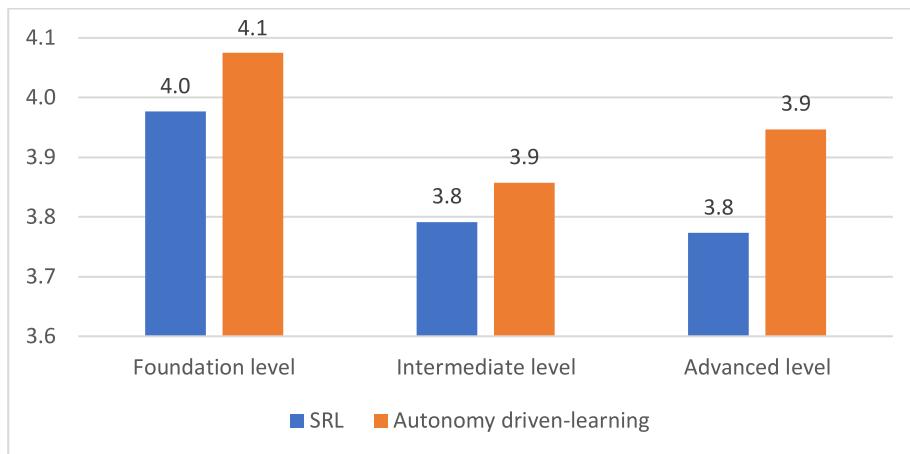
Figure 3 A comparison of the average scores provided by participants to the foundation, intermediate and advanced levels of the "autonomy-driven learning" and "SRL" MOOCs

5.2 Learners evaluation of MOOC design

Figure 4 shows the evaluation of the design of the MOOCs Autonomy Driven Learning and SRL, assessed through three general statements. For both the MOOCs, the average scores are always higher than 3,8 indicating a general appreciation of the learning design features. The design of the MOOC "autonomy-driven learning" received higher evaluation compared to the MOOC "SRL". For both the MOOCs the highest scores were obtained for the statement "I appreciate the use of different kinds of content (text, videos, pictures)" with an average score of 4,02 for the MOOC SRL and 4,09 for the MOOC Autonomy Driven Learning.
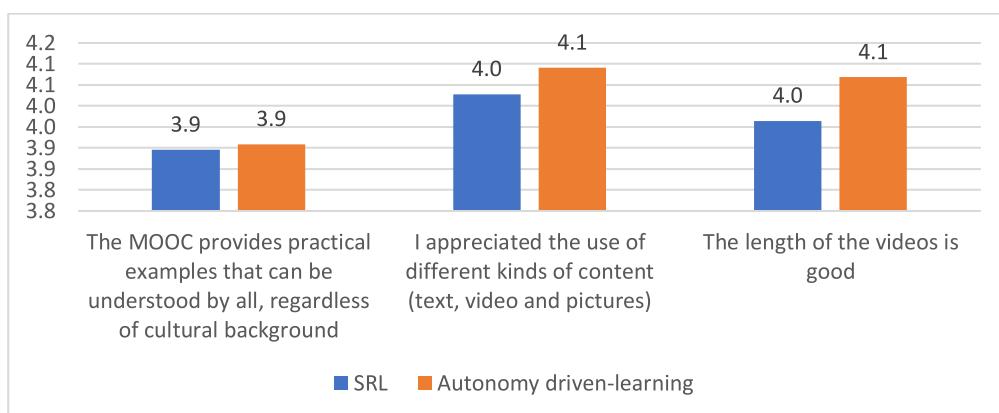
Figure 4 A comparison of the average scores obtain for three statements associated to the learning design in the MOOCs "autonomy-driven learning" and "SRL"

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Figure 5 shows the average scores obtained for quizzes presented in foundation and intermediate level. Quizzes received a very positive assessment, with average scores always higher than 3,7.
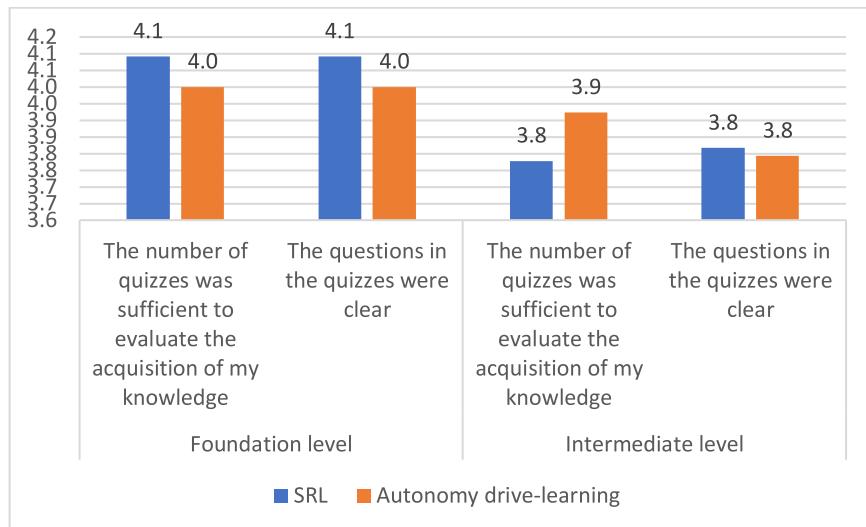

Figure 5 A comparison of the average scores obtain for quizzes presented in foundation and intermediate level of "autonomy-driven learning" and "SRL" MOOCs

Figure 6 shows the results of the evaluation of the learning design comparing the three levels of the MOOCs Autonomy Driven Learning and SRL. Generally, for all the statements the average scores are higher than 3,7 which indicate a satisfactory evaluation of the learning design within the three levels. The design of the two MOOCs' foundation levels received generally higher scores compared to the intermediate and advanced levels. The course duration was very positive assessed for the foundation level of the MOOC SRL (4,1). The number of quizzes was positively assessed for both the MOOCs' foundation levels with average scores higher than 4.
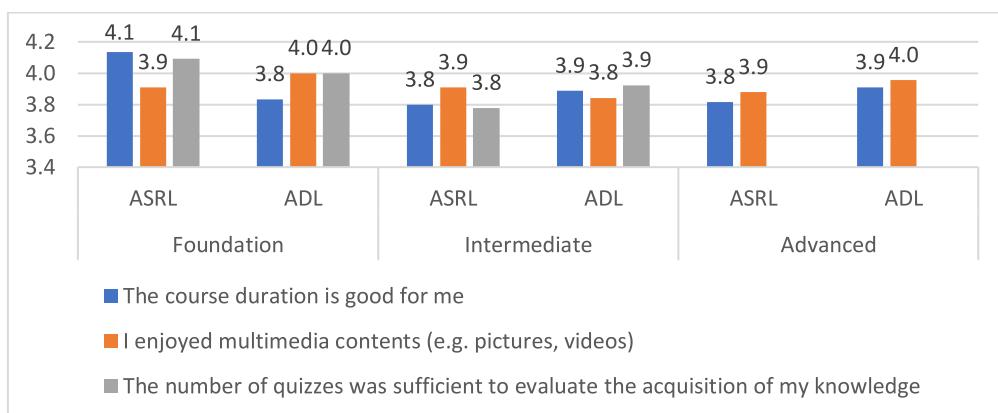

Figure 6 A comparison of the average scores obtained for the learning design of the three levels of the MOOCs Autonomy Driven Learning (ADL) and SRL (ASRL).

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5.3 Learners perception of MOOCs affordances for SRL skills

The average scores obtained for the 8 general statements regarding the MOOCs support for SRL are presented in Figure 7. The average scores are always higher than 3,6 to the 7 positive statements. The highest scores were obtained for the statements "I think this way of working is helpful for learning" (3,97), "The MOOC provides support for self-regulating the learning path" (3,91), and "The technological environment is friendly and usable" (3,90). On the other hand, the statement "I could choose my own learning pathway" obtained the lower average score (3,62). The only negative statement "In some places would have liked more information" obtained an average score of 3,2 which suggests a general nor agreement or disagreement with that statement.
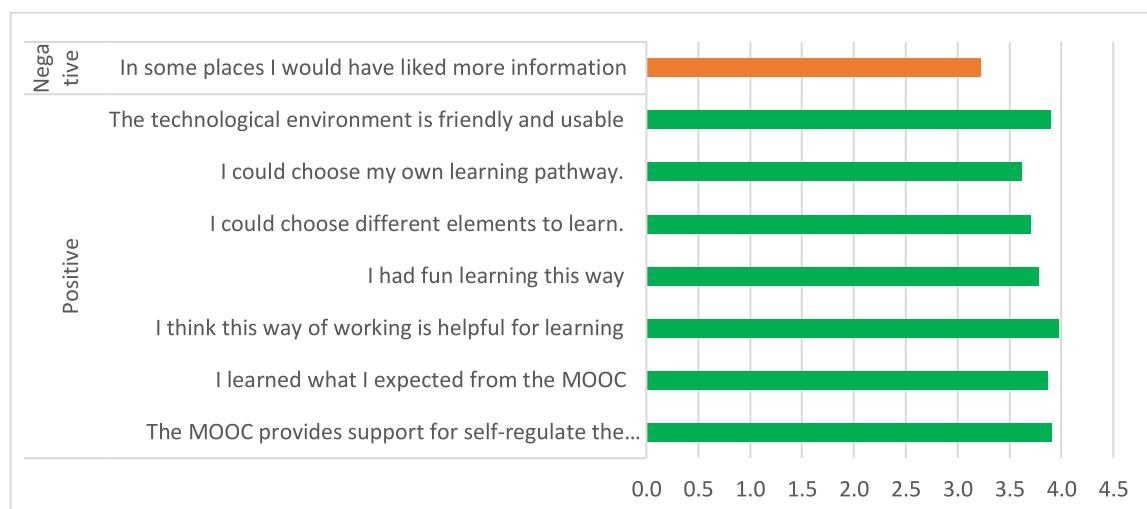

Figure 7 A comparison of the average scores for eight general statements regarding the SRL MOOCs support

The last section of the questionnaire asked participants to which extent the main MOOC features supported their SRL skills. The higher average scores were obtained for MOOC Path, MOOC hints, OERs, and quizzes with average scores higher than 3.76. Forum and gamification received the lower scores, with average scores respectively of 3,51 and 3,485 (see Figure 8).

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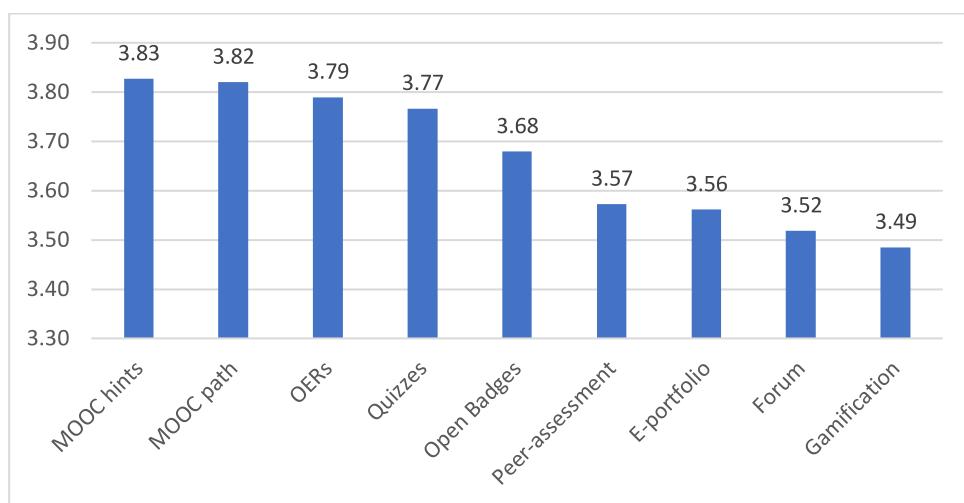
Figure 8 A comparison of the different MOOC elements impact on SRL skills according to the participants

Figure 9 shows in a more detailed way how the 9 MOOC features support different SRL skills, according to the two MOOCs participants.

1) OERs supported more Task analysis, Self-motivation, Self-observation and Self reaction;
2) Forum supported more Self-observation and Self-reaction;
3) Quizzes supported more Self-judgement;
4) E-portfolio supported more Self-control;
5) Peer-assessment supported more Self-motivation and Self-judgement;
6) Open-badges supported more Self-motivation;
7) Gamification supported more Self-observation, Self-judgement and Self-reaction;
8) MOOC path and hints supported more Self-observation skills;
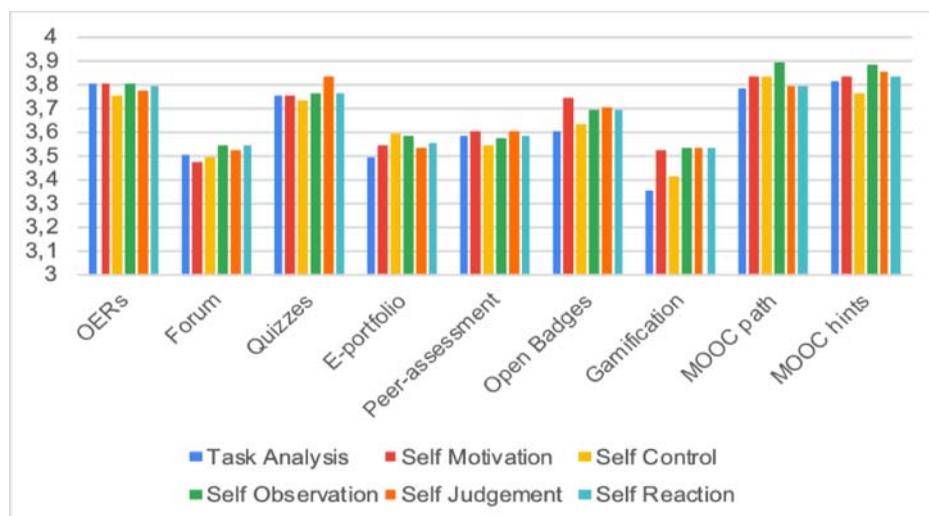
Figure 9 A comparison of the different MOOC elements impact on 6 different SRL skills according to the participants

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6. DISCUSSION AND CONCLUSION

The issue of engagement and completion in MOOCs has been widely discussed among educators and researchers. This article builds on research related to learning design of MOOCs and its impact on the learning experience. We described a SRL approach to designing engaging -learning experiences in miniMOOCs. Our case study from the OpenVM project investigated the experience of a sample of students who participated in the pilot assessment of the Autonomy-driven learning and SRL miniMOOCs in the OpenVM Mooc. The use of different OER formats and the productive tasks were foreseen with the aim of enriching the former design of MOOCs, that was initially criticized for being a simple list of videos with forum activities (Vázquez-Cano et al., 2018). The evaluation results indicate that the miniMOOC designed allowed learners to complete the course in a suitable amount of time and that the learning experience was enjoyable mostly due to video-based micro-content and the short learning format, as seen in previous stages of research (Buchem et al., 2019). This current work also adds the research related to other design elements which support SRL, and our data allows us to infer some new recommendations.

Following recommendations for learning design in MOOCs based on previous research (Lee et al., 2019; Pérez-Alvarez et al., 2016), our miniMOOCs include the following MOOC hints to facilitate participants SRL processes: diagrams showing learning pathways in miniMOOCs and highlighting where the learner is located at any moment, visual information about the number of OERs in each subMOOC and if they are video or text-based to help students manage their time and plan their learning strategies, and tutorials related to the e-portfolio, peer-assessment activities, earning Open Badges and a general description of the MOOC structure.

It is very interesting to explore with some more details the results achieved of the miniMOOCs elements in terms of SRL and consider them as recommendations for further educational research and implementation. Firstly, it can be seen that the information given and the visualization of the pathways have supported students SRL, as suggested by Pérez-Alvarez et al. (2016), and not only in the planning phases for which they were mainly thought (see Table 3), but also and in particular, for monitoring learning. This means that students appreciate constant information of their allocation (Lee et al., 2019) and that it is needed when performing learning. Secondly, OERs and quizzes obtain similar results in all phases, which could involve that the objects and their assessment have been designed in alignment and that have been useful in different phases of the SRL. It could be interesting to explore if quizzes highly valued for self-reflection were also used as strategies for monitoring learning as a kind of formative assessment (Alonso-Mencía et al., 2020; Littlejohn et al., 2016). Furthermore, as for the variety of formats, it is remarkable that they were more appreciated as diverse enough in the intermediate and advanced levels than in the foundational courses. This is extremely interesting because based on this, it could be suggested that the lower the levels, the more need for diversity of objects. Thirdly, Open Badges are relevant for all SRL phases but it is worth highlighting that they are more useful for preparing learning, which is the phase for which they were initially designed for in the OpenVM MOOC (see Table 3) which is the metacognitive task that is parallel to motivational belief for which badges have been related in research (Haug et al., 2014). The lowest levels in terms of SRL are those corresponding to

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elements which are related to social learning, like forums, eportfolios and the tool for group formation. In this case, further work should improve students' support in the context of social learning (Lee et al., 2019), which is particularly relevant when addressing a MOOC for preparing virtual mobility in international context.

The general satisfaction results show that students ranked higher in the foundational courses than the two others, which allows generating new hypotheses for further research. On the one hand, it allows us to think that automated subMOOCs support students' autonomy. On the other hand, this is consistent with the lower rates reached by social elements in intermediate and advanced courses, like forums and eportfolios for peer-assessment and the matching tool used for group formation. It would be very interesting to explore with further detail if students who attended successfully the foundational level showed higher levels of SRL skills. Another recommendation based on these results, is that the social approach to the OpenVM MOOCs should be scaffolded and promoted not only by the elements of the design but also with the support of teachers' role.

The results presented in this article need to be integrated with the perspective of other relevant stakeholders, such as e-learning experts inside and outside of the project. However, the learners' experience is at the core of any quality assurance process and future research should try to relate the development of skills and successful rates in the context of VM training.

7. Acknowledgements:

8. REFERENCES

Alonso-Mencía, M.E., Alario-Hoyos, C., Maldonado-Mahauad, J., Estévez-Ayres, I., Pérez-Sanagustín, M., & Delgado Kloos. C. (2020) Self-regulated learning in MOOCs: lessons learned from a literature review, *Educational Review, 72*(3), 319-345, https://doi.org/10.1080/00131911.2019.1566208

EDUTEC. Revista Electrónica de Tecnología Educativa. e-ISSN 1135-9250
Poce, A., & Amenduni, F.

Issue 75 / March 2021
Virtual mobility: opening up educational
mobilities

Buchem, I., & Carlino, C. (2019). *Implementation and User-Testing of Gamification for Learning in the Open Virtual Mobility Learning Hub*. Open Virtual Mobility Erasmus+ (2017-2020). https://www.openvirtualmobility.eu/topics/outputs

Buchem, I., Poce, A., & Tur, G. (2019). Microaprendizaje en práctica. In Salinas, J.; and Marín, V., I. (ed.) Monográfico microlearning. *Comunicación y Pedagogía*, (46-52).

Buchem, I., Tur, G., & Urbina, S. (2018). *Quality assurance for attainment, assessment and recognition of virtual mobility skills in context of open education. QA Framework in the Open Virtual Mobility project.* Edulearn Conference 2-4 July 2018. https://iated.org/concrete3/view_abstract.php?paper_id=65036

Challen, G., & Seltzer, M. (2014) *Enabling MOOC collaborations through modularity*. Proceedings of the 2014 Learning with MOOCs Practitioner's Workshop. http://blue.cse.buffalo.edu/papers/lwmoocs2014-mmoocs/

Colman, D. (2013). MOOC Interrupted: Top 10 Reasons Our Readers Didn't Finish a Massive Open Online Course. http://www.openculture.com/2013/04/10_reasons_you_didnt_complete_a_mooc.html

Gütl, C., Rizzardini, R. H., Chang, V., & Morales, M. (2014). Attrition in MOOC: Lessons Learned from Drop-Out Students. Learning Technology for Education in Cloud. *MOOC and Big Data, 37–48.* https://doi.org/10.1007/978-3-319-10671-7_4

Haug, S., Wodzicki, K., Cress, U., & Moskaliuk, J. (2014). Self-regulated learning in MOOCs: Do open badges and certificates of attendance motivate learners to invest more. In *U. Cress and C. Delgado (Eds.), EMOOCs*, 66-72. shorturl.at/htGP5

Jordan, K. (2015). Massive open online course completion rates revisited: Assessment, length and attrition. *The International Review of Research in Open and Distributed Learning, 16*(3). https://doi.org/10.19173/irrodl.v16i3.2112

Khalil, H., & Ebner, M. (2014). *MOOCs Completion Rates and Possible Methods to Improve Retention - A Literature Review.* In J. Viteli & M. Leikomaa (Eds.), Proceedings of EdMedia 2014, World Conference on Educational Media and Technology, 1305-1313. Tampere, Finland: Association for the Advancement of Computing in Education (AACE). https://www.learntechlib.org/primary/p/147656/

Kizilcec, R.F., Piech, C., & Schneider, E. (2013). Deconstructing Disengagement: Analyzing Learner Subpopulations in Massive Open Online Courses. In: Proceedings of 3rd International Conference on Learning Analytics and Knowledge, Leuven: Belgium, http://www.stanford.edu/~cpiech/bio/papers/deconstructingDisengagement.pdf

Lackner, E., Ebner, M., & Khalil, M. (2015). MOOCs as granular systems: design patterns to foster participant activity. eLearning Papers 42, 1-10.

EDUTEC. Revista Electrónica de Tecnología Educativa. e-ISSN 1135-9250
Poce, A., & Amenduni, F.

Issue 75 / March 2021
Virtual mobility: opening up educational
mobilities

https://graz.pure.elsevier.com/en/publications/moocs-as-granular-systems-design-patterns-to-foster-participant-a

Lee, D., Lee, S. L., & Watson, W. R. (2019). Systematic literature review on self-regulated learning in massive open online courses. *Australasian Journal of Educational Technology,35*(1), 28-41. https://doi.org/10.14742/ajet.3749

Littlejohn, A., Hood, N., Milligan, C., & Mustain, P. (2016). Learning in MOOCs: Motivations and self-regulated learning in MOOCs, *The Internet and Higher Education, 29*, 40-48. https://doi.org/10.1016/j.iheduc.2015.12.003.

Nicholson, S. (2012). *Strategies for meaningful gamification: Concepts behind transformative play and participatory museums*. Presented at Meaningful Play 2012. Lansing. http://scottnicholson.com/pubs/meaningfulstrategies.pdf

Poce, A. (2020). A Massive Open Online Course Designed to Support the Development of Virtual Mobility Transversal Skills: Preliminary Evaluation Results from European Participants. Journal of Educational, Cultural and Psychological Studies (ECPS Journal), (21), 255-273. https://doi.org/10.7358/ecps-2020-021-poce

Poulová, P., Černá, M., & Svobodová, L. (2009). University network? Efficiency of virtual mobility. In Proceedings of the 5th WSEAS/IASME International Conference on Educational Technologies (EDUTE09) (pp. 87-92). ISSN 1790-5109.

Pérez-Álvarez, R. Pérez-Sanagustín and M. J. J. Maldonado (2016) "How to design tools for supporting self-regulated learning in MOOCs? Lessons learned from a literature review from 2008 to 2016," *2016 XLII Latin American Computing Conference (CLEI)*, Valparaiso, 2016, pp. 1-12, doi: https://doi.org/10.1109/CLEI.2016.7833361.

Pilli, O., & Admiraal, W. (2016). A Taxonomy of Massive Open Online Courses. Contemporary Educational Technology, 7(3), 223-240. https://doi.org/10.30935/cedtech/6174

Sun, G., Cui, T., Guo, W., Beydoun, G., Xu, D., & Shen, J. (2015). Micro Learning Adaptation in MOOC: A Software as a Service and a Personalized Learner Model. *Lecture Notes in Computer Science, 9412*, 174–184. https://doi.org/10.1007/978-3-319-25515-6_16

Tereseviciene, M., Volungeviciene, A., & Dauksiene, E. (Eds.). (2011*). Virtual mobillity for teachers and students in higher education.* Kaunas: Vytautas Magnus University

Tur, G., Urbina, S., Firssova, O., Rajagopal, K., & Buchem, I. (2018). Open Virtual Mobility: a learning design 4 SRL. Proceedings of the EDEN Research Workshop 2018, Barcelona: Spain. https://research.ou.nl/ws/portalfiles/portal/7833338/pre_print_EDEN_2018_SRL_manuscript_final.pdf

EDUTEC. Revista Electrónica de Tecnología Educativa. e-ISSN 1135-9250
Poce, A., & Amenduni, F.

Issue 75 / March 2021
Virtual mobility: opening up educational
mobilities

Tur, G., Buchem, I., & Urbina, S. (2019). The self-regulated learning quality assurance approach to designing MOOCs. Insights from the Open Virtual Mobility project. Proceedings of the Edulearn Conference 2019, Palma: Spain. https://doi.org/10.21125/edulearn.2019.1403

Vázquez-Cano, D. E., López Meneses, D. E., Fernández Márquez, E., & Ballesteros Regaña, D. C. (2018). Los nuevos entornos virtuales de aprendizaje permanente (MOOC) y sus posibilidades educativas en ámbitos sociales y educativos. *Píxel-Bit. Revista De Medios Y Educación*, (53), 179-192. https://doi.org/10.12795/pixelbit.2018.i53.12

Zimmerman, B. J. (2002). Becoming a self-regulated learner: An overview. Theory into Practice, *41*(2), 64-70. https://doi.org/10.1207/s15430421tip4102_2

Cite this work: