

## Approaches on Slack Workspace Design

Maria-Camelia Chisăliță-Crețu<sup>1</sup>

(1) Faculty of Mathematics and Computer Science,  
Babeș-Bolyai University of Cluj-Napoca  
1, Mihail Kogălniceanu Street, RO-400084, ROMANIA  
E-mail: cretu[at]cs.ubbcluj.ro

### Abstract

*Successful teaching requires constantly adapting and improving the content, methods, and activities of the taught courses. This includes the adoption and tailoring for teaching purposes of those tools that ease communication and collaboration. The paper discusses Slack workspace design approaches used by educators to develop a virtual learning space. The analysis on the identified workspace designs following several criteria is presented. Practical experience on designing Slack workspaces together with relevant lessons learned are reported.*

**Keywords:** learning management systems, communication and collaboration tools

### 1 Introduction

Modern teaching makes use of learning management systems (LMSs) that create a learning environment mainly focused on content delivery and less on communication and collaboration. Integrated features that allow notification on posts or comments create often a great amount of e-mail to clean-up by teachers and students. Collaboration on different team-based projects is not highly promoted by LMSs. Therefore, other tools that enforce communication and collaboration are required, especially for computer science (CS) courses focused on various software development activities. Collaboration with industry representatives is important in CS-based course teaching, helping students to acquire competencies for their career by getting feedback from industry experts. This cannot be achieved using LMSs that are accessible to teachers and students only.

This paper addresses approaches on Slack workspace design used in CS-based courses for higher education. Slack platform is mainly used for communication purposes and project management and was smoothly integrated in teaching. Present work reports the findings on *how* Slack can be integrated in teaching from a technical perspective.

The main contributions of this paper are:

- an empirical research on the Slack workspace design and the identification of four types of raw workspace types that are combined by educators in order to achieve learning goals;
- the analysis of the Slack workspace design approaches following relevant criteria as organization, communication and collaboration.

The paper is organized as follows: *Section 2* briefly introduces the Slack platform, while the CS-based courses and the workspaces studied are discussed in *Section 3*. *Section 4* describes in great detail Slack workspace design specifics and the analysis on different criteria. Practical experience on designing workspaces and lessons learned are included in *Section 5*. The paper ends with conclusions in future work..

### 2 Slack Platform

Slack (Slack, 2020) is a channel-based communications platform released in 2014. By the first quarter of year 2020, Slack platform reported over 12,000,000 of daily active users (Smith, 2014).



VVTA2017	M	7	3 3	31	2	0	40
VVSS2018	M	12	1 98	195	2	1	21
VVTA2018	M	7	4 0	38	2	0	37
VVSS2019	M	12	2 00	195	2	3	21
TDT2019	E	12	9 1	82	1	8	21
VVTA2019	M	7	3 3	31	2	0	36
RPA2019	E	14	1 34	113	1	20	21
VVSS2020	M	12	1 99	196	3	0	21
TDT2020	E	12	8 6	78	1	7	21

#### 4 Slack Workspace Design

This section addresses the ways Slack workspaces can be designed in order to achieve learning goals. There are several approaches that can be adopted when designing a Slack workspace used for classrooms. These perspectives are analyzed in the following, using relevant criteria by educators.

##### 4.1 Workspace Design Approaches

Slack is a versatile platform that allows to design the workspace in order to achieve the intended learning objectives. There several ways to accomplish them, considering a few factors as:

- *course duration*, e.g., from 7 weeks in intensive courses to 12 or 14 weeks in whole term courses;
- *participant profile*, e.g., students enrolled may have or not extensive knowledge in using LMSs or other communication tools;
- *activity type and frequency*, e.g., students can acquire expected competencies by attending different types of activities designed by the educators, as individuals or working in teams;
- *teaching and learning resources*, e.g., materials' genre presented to the students that may include: lecture slides, activity-based requirement files, source code projects, audio/video files, etc.

Communication and collaboration on Slack is organized around the *workspace* and the *channel* concepts. Usually, teachers create a Slack workspace for a course, allowing students enrolled in the course to join a virtual space that facilitates communication and collaboration during classes. The teacher is the owner of the workspace and he organizes it according to the considered learning objectives by creating various channels (or groups) having different purposes. Based on the course outline and/or designed activities, the teacher may use the following raw approaches, each of them having certain particularities:

1. **timeline-based** – channels are created for each week and for each activity type;
  - participants are frequently asked to join specific channels to attend scheduled activities during the course deployment;

*Benefits:*

- participants access the information related to the discussed topic considering their order in the initial teaching plan;
  - useful for small groups that attend short courses;
- Downsides:*
- for large groups of students that collaborate in a specific activity at a specific time, the channel can get easily flooded with messages;
  - information on topics covered in several channels is scattered over the workspace;
  - participants easily lose the course overview due to the large number of channels;
2. **content-based** – channels are created considering the topics addressed over the entire course;
- participants are frequently asked to join specific channels in order to access details on the new topics while the course advances;
- Benefits:*
- participants have all the details on specific topics in a single place in the workspace;
  - useful for courses consisting of topics that are scarcely related;
  - useful for small groups that attend short courses;
- Downsides:*
- for large groups of students that collaborate in a specific activity, the channel gets easily flooded with messages and relevant information is scattered over the channel;
  - participants may not see the exiting relationships between various topics extensively discussed on different channels;
3. **activity-based** – channels are created for each type of activity designed to take place;
- channels are created in advance or when the first activity is scheduled to be held;
- Benefits:*
- participants access the details on a specific activity type in a single channel;
  - useful for courses consisting of a wide range of activities, e.g., seminars, labs, etc;
  - useful for large groups of participants attending short or long courses;
  - recommended when industry experts are involved in some activities (mentorship);
  - a better overview due to a reduced number of channels;
- Downsides:*
- some participants may not find related tasks and topics placed in different channels;
  - teacher needs to be very organized and refer correctly to each resource added to the channels;
4. **group-based** – channels are created for each group that attends the course on a particular activity;
- it can be shared by various groups having different participant profiles;
- Benefits:*
- participants access the information in a single place;
  - useful for short courses having a few activities or groups with different background;
- Downsides:*
- not recommended for long courses, where the channel content is constantly increasing, reducing the clarity on the discussed topics;
  - teacher work gets redundant when making available for students needed resources.

#### 4.2 Analysis

The raw approaches previously presented are rarely used separately by teachers. Most of the times a Slack workspace design for a course follows the activity and group-based organization and least the *timeline* or *content*-based approach. Modern teaching places the student in the center of the educational process (Alario-Hoyos et al, 2016; Infanti 2018; Ross, 2019). Teaching platforms adapted to this aim, considering the competencies the acquired by attending various activities, as

individual or as part of a group. Table 2 shows the summary of our analysis on the four default Slack workspace design approaches used in teaching. Three category criteria were investigated, focusing on:

- Organization** – the course degree of clarity reflected by the workspace structure;
- Communication** – the ease to communicate and interact over the workspace, considering its structure;
- Collaboration** – the ease to collaborate to achieve some tasks over the workspace, considering its structure;

The impact of some approach on a specific criterion can be *positive* (+) or *negative* (-) in cases the workspace structure favours or disfavours the named criterion. Still, there are cases where *the teacher may influence* the impact of the approach in one of the two ways (+/-). Therefore, it depends on the teacher's skills to lean the balance towards the positive (or negative) effect of the addressed criterion.

Table 2. Analysis summary on Slack workspace design approaches

Criterion	Timeli ne	Conte nt	Activi ty	Gro up
<b>Organization</b>				
optimal number of channels	-	+/-	+	-
disciplined topic organization	+/-	+	+/-	-
single place for information	+/-	+/-	+/-	-
<b>Communication</b>				
teacher to student(s)	-	+/-	+	-
student to teacher	-	+/-	+	+
<b>Collaboration</b>				
promotes team engagement	+/-	+/-	+	-
facilitates feedback offering	+	+	+	+

Considering the **organization criterion**, a course should have an optimal number of channels. A large number of channels available for *timeline* and *group*-based approaches disfavours the participant on having an overview of the activities he is involved in and how the discussed topics relate one to another.

A disciplined topic organization is required for any course. *Timeline* and *activity*-based approaches seems to require an additional effort from the instructor's part to remind the participants when and where were detailed the topics discussed in different activity types. For the *activity*-based approach this aspect is reduced as the existing channels are mapped to the carried out activities, e.g., lectures, seminars, labs, etc.

For *group*-based designed Slack workspaces, the information redundancy is increased, along with an consistent effort from the teacher to keep all the groups updated with the needed details. This aspect does not occur in *timeline* and *content*-based approaches if a topic is addressed during a single learning session. In case the course follows the *activity*-based design approach, the teacher can manage the redundancy in a reasonable manner.

Efficient **communication** from instructor to student(s) is essential in teaching. Communication may have various forms, e.g., announcements, polls, individual or team assistance. Slack workspaces designed based on the *timeline* and *group* approaches provide a low rate efficiency in terms of communication while the same information needs to be reminded several times on different learning sessions or to several groups of participants. Other approaches are less prone to redundancy by relying on channels created to provide a specific type of information.

Communication from student to teacher is enhanced in Slack workspaces regardless its design. For participants that share similar difficulties, it gets easier to benefit from tutoring or other support type. Workspaces designed based on the *timeline* approach have the advantage of considering previous learning session as content archives that needs to be handled by the student. Still, many participants that do not keep the pace or miss classes may find difficult to manage these channels and to grasp knowledge.

Tasks assigned for different activities elaborated by the teacher are mostly heterogeneous, allowing the participant to gain specific competencies. Engagement in diverse teams and taking responsibilities represents an opportunity to develop hard and soft skills required in future employment. Compared to other approaches, the *activity*-based approach firmly favours **collaboration** with people from the industry, i.e., software companies, that have a mentoring role in the classroom. This setup of the workspace creates a welcoming environment to collaborate, not burdening mentors with unsolicited requirements. Each approach on workspace design allows prompt feedback. The answers may have various forms, from a simple reaction or emoticon to elaborated feedback placed within a discussion thread. Thus, the flow of the discussion can be organized around a topic and not the comment entry throughout the channel.

## 5 Results

This section presents practical experience on designing Slack workspaces together with some lessons learned from adopting Slack platform in teaching.

### 5.1. Practical Experience on Designing Slack Workspaces

Different types of Slack workspace designs were used during the investigated period of time. Figure 1 shows the workspace designs employed for two teaching and learning sessions of different courses. On the left hand side, there is a snapshot of several channels created within VVTA2017 workspace, that consisted of 30 channels, built following the *timeline*-based design. On the right hand side, the *activity*-based design is shown for the VVSS2020 workspace, that consisted of 9 channels.



Figure 1. VVTA2017 and VVSS2020 workspaces design.

The first Slack workspace was employed for a short duration course, while the second workspace was used for a whole term course period. The amount of information processed for

both courses was similar. Students enrolled in VVTA2017 Slack workspace did not complain about the large amount of channels. Still, the general feedback indicates that students incline for the *activity*-based design for Slack workspaces. This aspect is influenced by the activity range that students are involved in. *Timeline*-based design is hard to manage by the teachers, as channel naming guidelines apply.

## 5.2. Lessons Learned

Similar to most teaching and learning tools, Slack platform exposes along with benefits several downsides and limitations. Teacher should consider the fact that some student may not have used Slack platform before and there may be a learning curve in the target group. Tool presentations, demos and tutorials on how to use it are welcomed when educators use the same communication platform for several years for different groups.

Students should be coached in the beginning of the course on the main intent of each channel. This helps the students having an overview on the Slack workspace, the activity types and the way the communication will occur using public/private channels and direct messages. When the teacher clarifies from the beginning, students are confident to use it. Teachers should offer technical support on Slack platform for students, when needed.

This cannot be achieved by other administrative staff, especially in cases where many teaching and learning tools are used by different educators. The Slack workspace owners have administrative responsibilities as well. Our experience in using Slack platform for content, communication and collaboration in CS-based courses indicates that each course session should have a dedicated workspace. The use of one a single communication tool instead of several tools that may overlap in some features is reported by Robert Talbert (Talbert, 2019) as well. Public communication using Slack channels and private communication through direct messages is recommended.

## Conclusions

This paper addresses the Slack workspace design used for teaching purposes. We have presented *timeline*, *content*, *activity* and *group*-based approaches on the Slack workspace design, that can be combined in order to achieve the learning goals. We have identified several factors that have an impact on deciding the workspace design as: the course duration, participant profile, activity type and frequency, and the teaching and learning resources. We have analyzed the identified Slack workspace design approaches considering the organization, communication and collaboration criteria.

Future research in Slack adoption in the classroom include application integration especially in CS-based courses. More, we intend to pursue our investigation toward the bots development and integration in Slack platform from the teaching perspective, addressing the advantages and possible issues.

## References

- Alario-Hoyos, C., Delgado-Kloos, C., Estévez-Ayres, I., Fernández Panadero, C., Blasco, J., Pastrana, S., Suarez-Tangil, G., and Villena-Román, J. (2016), Interactive activities: the key to learning programming with MOOCs, in *Proceedings of the European Stakeholder Summit on experiences and best practices in and around MOOCs (EMOOCs 2016)*, University of Graz, Austria, 319-328.
- Chisăliță-Crețu, C. (2018), VVTA Course Syllabus, <https://www.cs.ubbcluj.ro/files/curricula/2018/postuniversitarinformatica/>, accessed on June 2020.
- Chisăliță-Crețu, C. (2020a), RPA Course Syllabus, [https://www.cs.ubbcluj.ro/files/curricula/2020/syllabus/IR\\_sem5\\_MLE5147\\_en\\_cretu\\_2020\\_5576.pdf](https://www.cs.ubbcluj.ro/files/curricula/2020/syllabus/IR_sem5_MLE5147_en_cretu_2020_5576.pdf), accessed on June 2020.

- Chisăliță-Crețu, C. (2020b), TDT Course Syllabus, [https://www.cs.ubbcluj.ro/files/curricula/2020/syllabus/IR\\_sem6\\_MLE5110\\_en\\_cretu\\_2020\\_5247.pdf](https://www.cs.ubbcluj.ro/files/curricula/2020/syllabus/IR_sem6_MLE5110_en_cretu_2020_5247.pdf), accessed on June 2020.
- Chisăliță-Crețu, C. (2020c), VVSS Course Syllabus, [https://www.cs.ubbcluj.ro/files/curricula/2020/syllabus/IR\\_sem6\\_MLR5014\\_ro\\_cretu\\_2020\\_5005.pdf](https://www.cs.ubbcluj.ro/files/curricula/2020/syllabus/IR_sem6_MLR5014_ro_cretu_2020_5005.pdf), accessed on June 2020.
- Infanti, L. (2018), Learning management systems, redesigned — A UX case study, <https://uxdesign.cc/lms-redesigned-part-i-8f038eb726ba>, accessed on June 2020.
- Ross, S. M. (2019), Slack it to me: Complementing LMS with Student-Centric Communications for the Millennial/Post-millennial Student, *Journal of Marketing Education*, 41, 91 – 108.
- Slack (2020), Slack platform, <https://slack.com/intl/en-ro/>, accessed on June 2020.
- Smith, C. (2020), 55 Slack Statistics and Facts (2020) | By the Numbers, <https://expandedramblings.com/index.php/slack-statistics/>, accessed on July 2020.
- Talbert, R. (2019), The rise and fall of slack in my teaching: A cautionary tale, <https://rtalbert.org/the-rise-and-fall-of-slack-in-myteaching-a-cautionary-tale/>, accessed on July 2020

# **S e c t i o n**

## **INTEL® EDUCATION Innovation in Education and Research**

### **21st Century challenges (IntelEDU):**

- **Digital Curriculum, collaborative rich-media applications, student software, teacher software**
- **Improved Learning Methods, interactive and collaborative methods to help teachers incorporate technology into their lesson plans and enable students to learn anytime, anywhere**
- **Professional Development, readily available training to help teachers acquire the necessary ICT skills**
- **Connectivity and Technology, group projects and improve communication among teachers, students, parents and administrators**

