

MOOC: Basics of Sky Recognition

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Abstract. Astronomy is a theme that motivates and engages people in search for knowledge, both from the perspective of formal and non-formal education. In this work, we present the motivations that led to the development of a Massive Open Online Course (MOOC), carried out with the support of the department of distance learning – SEAD/UFRGS. The main objective of MOOC is to provide subsidies for sky observation, with the support of celestial charts, applications/software. We opted to organize it in four modules, exploring the sky considering visible stars according to the seasons and the associated astronomical concepts. Initially, we were planning to include video lessons, supported by texts and module's closing activities. Due to suspension of on-site activities at the university, as a result of the Covid-19 Pandemic, it was necessary to review course's material.

Resumo. Astronomia é um tema que motiva e engaja as pessoas na busca pelo conhecimento, tanto na perspectiva da educação formal quanto na não formal. Neste trabalho, apresentamos as motivações que levaram ao desenvolvimento de um Massive Open Online Course (MOOC), realizado com o apoio da Secretaria de Educação a Distância – SEAD UFRGS. O principal objetivo do MOOC é fornecer subsídios para a observação do céu, com o apoio de cartas celestes, aplicativos/software. Optamos por organizá-lo em quatro módulos, explorando o céu a partir das estrelas visíveis de acordo com as estações e os conceitos astronômicos associados. Inicialmente, pretendíamos incluir videoaulas, apoiadas em textos e realização das atividades de finalização dos módulos. Devido à suspensão das atividades presenciais da universidade, em decorrência da Pandemia Covid-19, foi necessário revisar o material do curso.

Keywords. Teaching of Astronomy

1. Introduction

Astronomy is a subject that motivates and engages people in search for knowledge, both from the perspective of formal and non-formal education (Ghanem 2008). The UFRGS Planetarium Prof. José Baptista Pereira is one of the spaces at the university that works in scientific dissemination. Among the actions developed there is an face-to-face outreach course on basic notions of sky recognition, which had already taken place in two editions, the last in January 2020. In the last edition, the course attracted 10 times more people than the number of vacancies available (Fig. 1). With this in mind we decided to offer a distance learning course on the theme.

In January 2020, we submitted a proposal for a Massive Open Online Course (MOOC) in the public notice from the University's department of distance learning (SEAD/ UFRGS). The MOOC: Basics of Sky Recognition (Fig. 2) was approved with one undergraduate grant concession. At the UFRGS, the MOOC courses are available for free on Lúmina platform. All materials in this site are developed by university professors, technicians, and students. In this platform courses are self-training and, at first, there is no mediation by a teacher or tutor¹. It is possible that in some courses there is more interaction, but all courses are selected to take place independent of mediation and following a sequence that allows students to progress at their pace. We intended to adapt the Planetarium outreach course to the virtual format having video-classes as a guideline. Although, in March 2020 due to Covid-19 pandemic, university interrupted face-to-face activities. As a result, we need to rethink the course material because we wouldn't rely on the structure of SEAD / UFRGS. On the other hand, non-formal education activities and scientific divulgation virtual initiatives become even more necessary. This new scenario brought new challenges to be overcome.



FIGURE 1. Figure 1: The outreach course participants at UFRGS Planetarium hall, in January 2019.

In next Section we present more detail about course's structure modules and contents.

2. MOOC: Basics of Sky Recognition

A MOOC course is characterized by being open and without prerequisites for its realization, allowing access by a significant number of students. This type of course presupposes independent, asynchronous and in the participant's own time realization, but in a closed way, that is, it is not possible to change how the contents are developed. MOOCs usually base the evaluation process on objective questionnaires, correction of activities by experts, peer evaluation and evaluation of posts in forums (Souza & Cypriano 2016).

¹ <http://www.ufrgs.br/sead/cursos/moocs-1/lumina>



FIGURE 2. Figure 1: The outreach course logo created by SEAD/UFRGS.

The MOOC developed by us, aims to discuss the basics of celestial observation with the naked eye or through instruments (telescopes, binoculars). Initially, the course would focus on making content available via videos, with complementary materials (pdfs and module's closing activities). Due to Covid-19 pandemic, a course was designed based on multi-format materials. The main content is accessed through interactive material that has effects and animations. Through these, texts, images, videos, game and infographics are available. In some cases, the material redirects the participant to external links. For each module, there are closing activities that must be performed to proceed to the next step.

The course objective is: (i) to provide students with subsidies to carry out direct observations of the sky, with the support of celestial charts, applications, and software; (ii) to highlight astronomical concepts associated with different seasons of the year, in particular the cyclical changes of the sky throughout the year resulting from the rotation and translation of the Earth. for this propose, we organized the course in four modules.

The first module aims to work on how different cultures and societies, which have established themselves throughout human history, have established their ways of knowing the sky and associated phenomena of nature, resulting in different stellar cultures. The second module aims to present at the basics of astronomical coordinates for observation. In this way, we present concepts such as the Sphere and Celestial Equator, the Horizontal and Equatorial Coordinate System, zenith, meridian, Ecliptic. In the third and fourth modules, we explore the summer/winter and spring/autumn skies. Here we consider the seasons of the year like an astronomical phenomenon, determined by the passage of the Earth through notable points in its orbit around the Sun (solstitial and equinoctial points).

3. Conclusions

The MOOC development project is also associated with an undergraduate scholarship. Thus, from the perspective of student

education, the activities impacted the training of students in technical and citizenship aspects. Participation in the project promoted learning about the production of materials for audiences of different age groups. Furthermore, the work allowed contact with the ways in which different cultures establish their relationship with the sky.

During the year 2021, the MOOC had part of its materials and approach implemented as support in two 8-hour synchronous courses at the UFRGS Planetarium (The Autumn Sky and the Winter Sky) and two shows on the Spring Sky. Based on this experience, the MOOC will be available in the first semester of 2022. The course's format allows additional class videos to be incorporated in the future.

References

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