

WRITTEN RESOLUTION OF A MATHEMATICAL PROBLEM BY 11TH GRADE STUDENTS

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Problem solving and written communication are strongly connected, since the resolution of a problem presupposes the use of written communication to record the reasoning, either to communicate with another person or to review the resolution in the future. Bearing in mind this relation, and also considering the relevance of both in learning mathematics, our research question is: how students communicate their resolutions of a mathematical problem in writing? To answer this, we made a qualitative research with an interpretative paradigm. The participants were 29 students of 11th grade, divided into six working groups, who voluntarily signed up for a problem-solving project developed online and in an extracurricular format. In this poster, we show the analysis carried out on the written resolutions of each group to one of the problems proposed in that project. With this study, we try to contribute with categories that help to analyze written communication, and to improve and highlight the importance of that topic in solving math problems, and in the teaching in general.

The analysis' categories we used in this investigation was inspired by the ones written by Santos and Semana (2015), considering four points: correctness, completeness (divided into justification level, justification type, and final answer), representations, and organization. In the analysis of the results, only one group presented an incorrect answer, being also the only one with an absent final answer and null justification level. Still regarding the justification level, two of the correct resolution presented a low level, one a medium level, and the remaining two a high level. The justification type and the representations may be related to these results, since the resolutions with a null and a low justification level used exclusively rules and only symbolic representation. The medium and high-level ones, on the other hand, conjugated symbolic representation with verbal language, and resorted to more than one justification type – which could mean that the use of more than one type of representations can lead to better written communication. As for organization, the high-level resolutions were the only ones with an organized resolution.

Acknowledgement

This work is supported by FCT through a PhD scholarship (SFRH/BD/147510/2019) and CIEd – UIDB/01661/2020 and UIDP/01661/2020, IE-UMinho, FCT/MCTES-PT.

References

Santos, L., & Semana, S. (2015). Developing mathematics written communication through expository writing supported by assessment strategies. *Educational Studies in Mathematics*, 88(1), 65–87. <https://doi.org/10.1007/s10649-014-9557-z>