

# A Report on the Temperature of Office 5.34

Mohammad Tahaei\*, Kholoud Althobaiti\*, Andrew R. Faulds\*, Chad Stevenson†

\*School of Informatics, University of Edinburgh

†School of Philosophy, Psychology and Language Sciences, University of Edinburgh

**Abstract**—While the Informatics Forum is a great place to work, there are some issues with air quality. This short paper reports a 12 day analysis of room temperature in office 5.34. It also reports a survey of 13 PhD students who are on level 5 of the Forum. Interpretation of the results is left for the reader.

## I. INTRODUCTION

The University of Edinburgh’s health and safety policy states: “It is the University Court’s Policy, so far as is reasonably practicable: to provide and maintain a working environment for employees and students that is safe and without risks to health and is adequate as regards facilities and arrangements for their welfare<sup>1</sup> at work” [1]. As PhD students, we spend many hours in the Informatics Forum, and it is evident to some of us that the air quality/temperature does not meet the university’s standards, or our own.

Students of Office 5.34 have raised their concerns on two separate occasions. The first on 18/08/2018 and second on 01/10/2018. Both claims were submitted to the official email address for building issues, forum-issues@inf.ed.ac.uk. However, these issues have not been adequately resolved. In this article, we examine empirical data collected from dates 04/02/2019 to 19/02/2019. We argue the collected data supports our claim that the temperature and air quality is not meeting the aforementioned University of Edinburgh’s health and safety policy [1].

## II. METHODOLOGY & DATA ANALYSIS

We collected data with two instruments, a digital thermometer<sup>2</sup> and a survey.

We logged temperature every working day starting from 04/02/2019. Our effort was to log four data points for every day (9 – 10am, 1 – 2pm, 5 – 6pm, and 10 – 11pm). However we could not record four data points every day, hence we only report an average of values for each day. We record inside room temperature (in Celsius), humidity (in percentage), outside temperature (in Celsius, we used our phones/PC weather app, either on Android or Apple), and the number of people who are in the office. Figure 1 shows these values across 12 days.

<sup>1</sup>Welfare being, broadly construed, the happiness, fortune, or desires, which are ultimately good for an individual, or group. “The health, happiness, and fortunes of a person or group.” [https://en.oxforddictionaries.com/definition/welfare]

<sup>2</sup>Habor 118AB Indoor Thermometer from Amazon: <https://www.amazon.co.uk/dp/B07GWL6ZFY/>

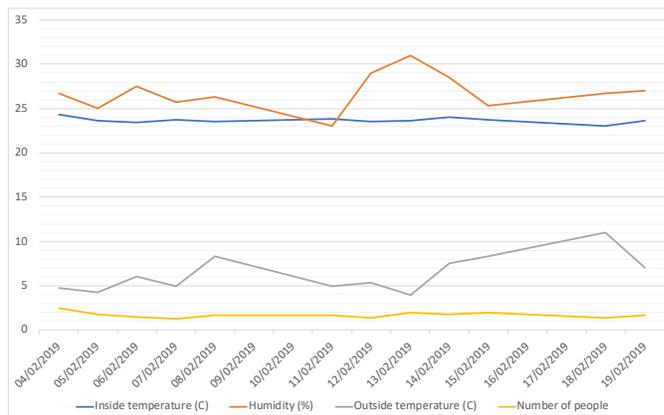


Fig. 1. Values for inside and outside temperature, humidity and number of people in the office.

The survey was distributed in inner circle offices on level 5 where PhD students are located (20/02/2019). We did not gather data from offices with windows, as they have a chance to open windows whenever they need it. The survey questions were:

- 1) How satisfied are you with the temperature in your workspace? (Very Satisfied to Very Dissatisfied)
- 2) How satisfied are you with the air quality in your workspace? (Very Satisfied to Very Dissatisfied)
- 3) All things considered, how satisfied are you with your personal workspace? (Very Satisfied to Very Dissatisfied)
- 4) Overall, does the temperature in your workspace enhance or interfere with your ability to get your job done? (Enhances to Interferes)

Figure 2 shows the results for survey.

## III. DISCUSSION

When it comes to the optimum room temperature the NHS recommends 18°C [2]. Other researchers such as Jaakkola et al. [3] suggest  $21 \pm 2^\circ\text{C}$ . Based on our results temperature in office 5.34 has been in average 23.6°C (range: 22.2 – 26.4, std: 0.7). Recommended humidity is between 30 – 50% [4], average office 5.34 humidity has been 26.7% (range: 22 – 34, std: 2.63).

Nevertheless, we should not forget about the flow of fresh air in offices without any windows. The ventilation system is supposed to bring fresh air in to these offices, however, at least

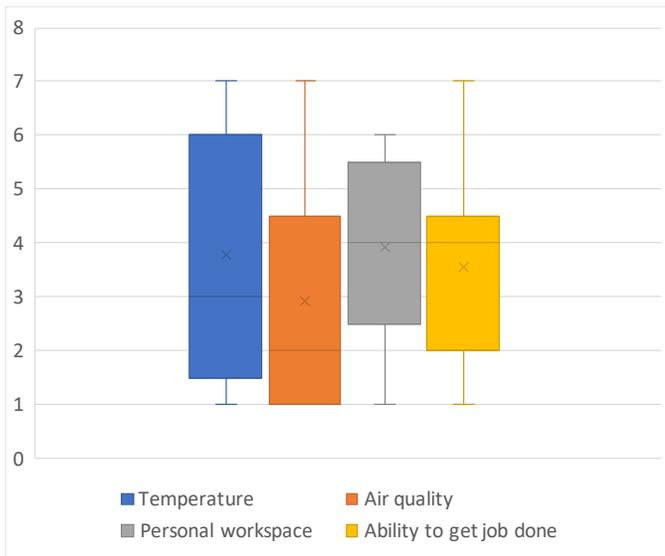


Fig. 2. Likert scores for the survey. Values are from 1 to 7. For temperature, personal workspace, and air quality values range between very dissatisfied to very satisfied, and for ability to get job done they range between interferes and enhances.

in office 5.34, we do not feel happy with the flow of fresh air and we find the lack of fresh air stifling.

We believe that the recorded numbers show the difference between the optimum working environment and the conditions present in office 5.34. Several studies look at the importance of the office environment and its influence on productivity [5]–[8]. Seppanen et al. in particular state that productivity goes up with temperature up to 21°C and goes down above 23 – 24°C. Therefore, sub optimal temperature conditions may have a negative effect on the productivity of people using these office spaces.

The Informatics Forum, as both a community and a location, is a wonderful workplace. There are many positive points in working here, including lovely people (students, faculty, and support staff), location in central Edinburgh, and a beautiful building with ever-tempting communal spaces. The many delights of this space have drawn us back day after day in spite of our discomfort in our own office. These positive aspects makes the troublesome climate stand out more. We hope that issues with air quality and temperature will be solved very soon and thus increase our satisfaction and productivity.

#### IV. LIMITATIONS AND FUTURE WORK

Our data only represents one office in the Informatics Forum and was collected over a short period of time, therefore our results cannot be extended to any other offices or seasons/months. Collection of more data by measuring temperature in other offices is one direction we could take, moving forward. Taking these factors into consideration is left as future work. We also recognise that we did not mention how the AC works because we could not measure how it works.

We did not have access to high-end tools to measure other factors such as air particle density or air velocity, even so,

with our rudimentary instruments, a problem is visible. That problem, as we have detailed and made clear from the above empirical data, is that temperature and humidity is substandard and effecting the welfare and productivity of students on said level.

#### DISCLAIMER

We are not funded by any third party and the production of this paper is completely motivated by our personal interests. We do not claim that we are experts in the field but as users and people who spend a significant part of their life in this building, we wish to make our concerns heard by the responsible authorities.

#### ACKNOWLEDGEMENT

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#### REFERENCES

- [1] T. U. of Edinburgh, *Health and Safety Policy Statement*, 2011 (accessed Feb 20, 2019), <https://www.nhs.uk/live-well/healthy-body/keep-warm-keep-well/>.
- [2] NHS, *Keep warm, keep well*, 2017 (accessed Feb 20, 2019), [https://www.ed.ac.uk/files/atoms/files/health\\_and\\_safety\\_policy\\_statement.pdf](https://www.ed.ac.uk/files/atoms/files/health_and_safety_policy_statement.pdf).
- [3] J. J. Jaakkola, L. M. Reinikainen, O. P. Heinonen, A. Majanen, and O. Seppänen, “Indoor air quality requirements for healthy office buildings: recommendations based on an epidemiologic study,” *Environment International*, vol. 17, no. 4, pp. 371–378, 1991.
- [4] NHS, *Millions ‘allergic to their own home’, says charity*, 2011 (accessed Feb 20, 2019), <https://www.nhs.uk/news/lifestyle-and-exercise/millions-allergic-to-their-own-home-says-charity/>.
- [5] S. ichi Tanabe, N. Nishihara, and M. Haneda, “Indoor temperature, productivity, and fatigue in office tasks,” *HVAC&R Research*, vol. 13, no. 4, pp. 623–633, 2007.
- [6] A. Leaman, “Dissatisfaction and office productivity,” *Facilities*, vol. 13, no. 2, pp. 13–19, 1995.
- [7] O. Seppanen, W. J. Fisk, and D. Faulkner, “Control of temperature for health and productivity inoffices,” *ASHRAE transactions*, vol. 111, no. LBNL-55448, 2004.
- [8] L. Lan, Z. Lian, and L. Pan, “The effects of air temperature on office workers well-being, workload and productivity-evaluated with subjective ratings,” *Applied ergonomics*, vol. 42, no. 1, pp. 29–36, 2010.