

# Ergo Expert Talk: Dr. Ahmet Çakir



**Dr. Ahmet Cakir**

Since 1980 Dr. Ahmet Çakir has been the scientific manager of the ERGONOMIC Institute for Social and Occupational Sciences in Berlin. He was a Fellow of Ergonomic Society and Editor-in-Chief of the scientific journal Behaviour & Information Technology. Dr. Çakir is the chairman of the international standardization committee ISO/TC159/SC4/WG3 responsible for the standardization of the workspace and work environment and of the national German committee NAErg/NIA: Ergonomics for information processing systems. Dr. Çakir was also the principal author of 'The VDT Manual' which has been published in five languages and is a landmark event in human computer interaction.

## Q1: What has changed over the years in the way people work?

Thanks to new technologies, like e-mail, the number of decisions made per day has gone up fast. Also people spend more time in meetings and in discussions, most office buildings have a meeting space problem as a result.

Companies have become more efficient, with half the cost of the 1980s they earn double the amount of money. In earlier times, the manager did not control every step in the work process. Nowadays a manager can monitor staff at six different cities and the staff work at home. The combination of all of these factors results in the need for managers to monitor every step of the work process. In order to facilitate them to do so a lot of jobs has become highly standardized, without needing creativity from the workers. And within these highly standardized work there are no more jobs without high time pressure. Everybody has to keep up the pace.

## Q2: What is the biggest challenge in current offices?

One of the biggest challenges is noise distraction in offices. The base sound level of an office without people has lowered from 50-75 dB(A) in the 1970s to at max 37 dB(A). The current noise levels are mainly caused by airconditioning systems. The noise of old keyboards for example has vanished almost completely, partly because of the new work organization.

All noise people complain about in offices today is due to talking: either talking to others in the room or to the telephone. Depending on the number of people who have to talk at the same time we have an average sound level up to 55 dB(A). What has changed, however, is the number of noise events per hour. In the 1970s a person would talk about 8% of the work time. This figure has risen to about 30% now. This means it is possible nowadays that with 4 persons in a room there is constant conversation. A constant high sound level is not extremely distracting, but the changes in sound levels (conversations) are currently the biggest distractions. The increasing number of conversations in the office is the biggest problem.



### Q3: What is in your opinion the solution for the noise problem in offices?

We have implemented a number of solutions. One of them is to introduce high quality headsets so that the quality of the connection between a person inside and for example a person driving in the car is improved. In addition, we train people how to talk. Focusing on acoustics of the building can only lower noise levels by about 2 dB(A), whilst the same person on the phone speaks with a range of 25 dB(A) and an even greater difference in the sound level of different persons is measured. Another solution is group training to understanding the needs of others and understanding that informal conversations are needed to perform the job well.

## Q4: Can you share some thoughts about “open office spaces”?

Since the 1960s the idea of more open offices has been implemented in Germany. However, this does not work generally. People who benefit from the formal and informal interaction with colleagues tend to accept the distractions associated with it. However, it does not work for the majority of people in normal offices. Even in small cells, with 2 persons in a room, there is the problem of noise distraction created by the other person talking with a person outside of the office.

If you place one person in a single room in the office, that person is likely to lose creativity. At the other end, I have seen examples of groups of hundred workers that persisted to stay in the same (big) room. The task at hand for this group was retouching pictures and conversations were constantly needed and highly appreciated for coordinating the precise work. These workers had a lot of private communication that was essential for getting the job done with high quality.



If you put two people in a room, which is “standard” in Germany, then the question is whether these two persons fit. Both the organizations and the individuals should think about the benefits versus the annoyances. If the people are in different work processes, then you can expect annoyances and low benefits. If they are cooperating in the same work process, then they will perceive more benefits and far less annoyances.

## Q5: What in your opinion is an ergonomic workplace for a knowledge worker?

There is much less paper now than in the past. However to have access to all this information, we need multiple screens (Dr Çakir has 3 on his workplace) The acoustics should be fit to the needed collaboration. If there is a high need for collaboration a more open office is ideal, if there is a low need for collaboration and a high need for concentration, then a cell office is preferred. Finally, we should limit noise distractions in order to be able to concentrate well, e.g. by organizational provisions.

## Q6: Do you see desktop working is widely replaced by laptops in Germany?

Yes, however I don't think this a good idea without using an extra monitor and external mice and keyboard. I had developed the idea that the keyboard and screen should be separated in the early 1970s because people are different. With a laptop you don't get an acceptable fit between a worker and his computer. Our clients have all laptops for practical reasons of working at different places. They use docking stations and a separate screen. The only function of a laptop is left to be a computer. The more modern version, a tablet with a separate auxiliary keyboard allows a much better fit with the users.

## Q7: Do you think input devices (keyboards, mice) can be further improved in the future?

I think it won't change much. The mouse is the cheapest and the most precise of all alternatives, including gesture and touch based inputs. You can work most precisely when using your hand and arm together with a mouse. The same can be accomplished with the tablet, although it takes more time for picking up and homing the pen.

The same goes for keyboards. In the 1980's it was suggested voice input would substitute keyboard input. However, nobody is able to talk for eight hours without extreme strain. And then you have the distractions for co-workers and the missing "privacy of keyboards". If we would use voice, we will have lower privacy levels and even more distraction.

Another issue is that computers have not become that powerful that voice input is converted into type without errors. For that reason, the keyboard has never been replaced. The bad thing is that you need extra pointing devices next to the keyboard.

What we have done for our customers, is that we advised them compact keyboards without the numpad because the majority of users do not use the numpad. I was the inventor of the term compact keyboard. In our standard, ISO 9241-410, the compact keyboard is the primary input device. For our customers, we planned compact keyboards and an Evoluent mouse. People can decide to keep their old keyboard, or to get a compact keyboard plus an Evoluent mouse plus a separate numpad if they need a substantial level of numerical input in their jobs.



Numpad: the numerical keypad on the far right of a standard keyboard is not used by the majority of computer users. Dr. Çakır set the keyboard without the numpad, the compact keyboard as the standard for keyboards.



## Q8: What is your opinion about sit-stand tables.?

In the 1970's nobody accepted sit-stand desks although they were recommended. I was aware of the benefits because as a student I worked standing at the drawing desk and had small breaks in between. I thought everybody would like to work like that. German manufactures of office furniture were not very proficient dealing with metal at that time. They were used to working with wood, and that did not work with height adjustable furniture. From 1976 onwards we have worked for a manufacturer of sit-stand tables in Germany. I have advised him to keep the traditional desks, because not everybody likes sit-stand furniture. For our customers it is a standard now.

## Q9: Why are sit-stand tables a standard for your customers?

The argumentation is in the standard ISO 9241- part 5. In principle, each person should have a fit between his/her workplace and her/his body dimensions. Manufacturers started off with a fixed height desk as a standard. Accommodation to body sizes was possible in principle with the help of footrests. However, manufacturers standardized the width of footrests to 45 cm. And that is not sufficient. People move and should move even whilst they are seated. The footrests were not appropriate and low numbers were sold. The outcome was that we had a desk of 72 cm: not high enough for 30% of people and too high for another 30%. So no acceptable fit for 60% of the people.

We decided to create a standard and make the fit a generic principle, plus allow the manufacturers to achieve it in different ways: via full adjustability, via different sizes and partial adjustability and via custom made tables for individuals. We postulated that 100% of people need fit between their body dimensions and the table they work on.



## Q10: What are the positive effects of using sit-stand desks?



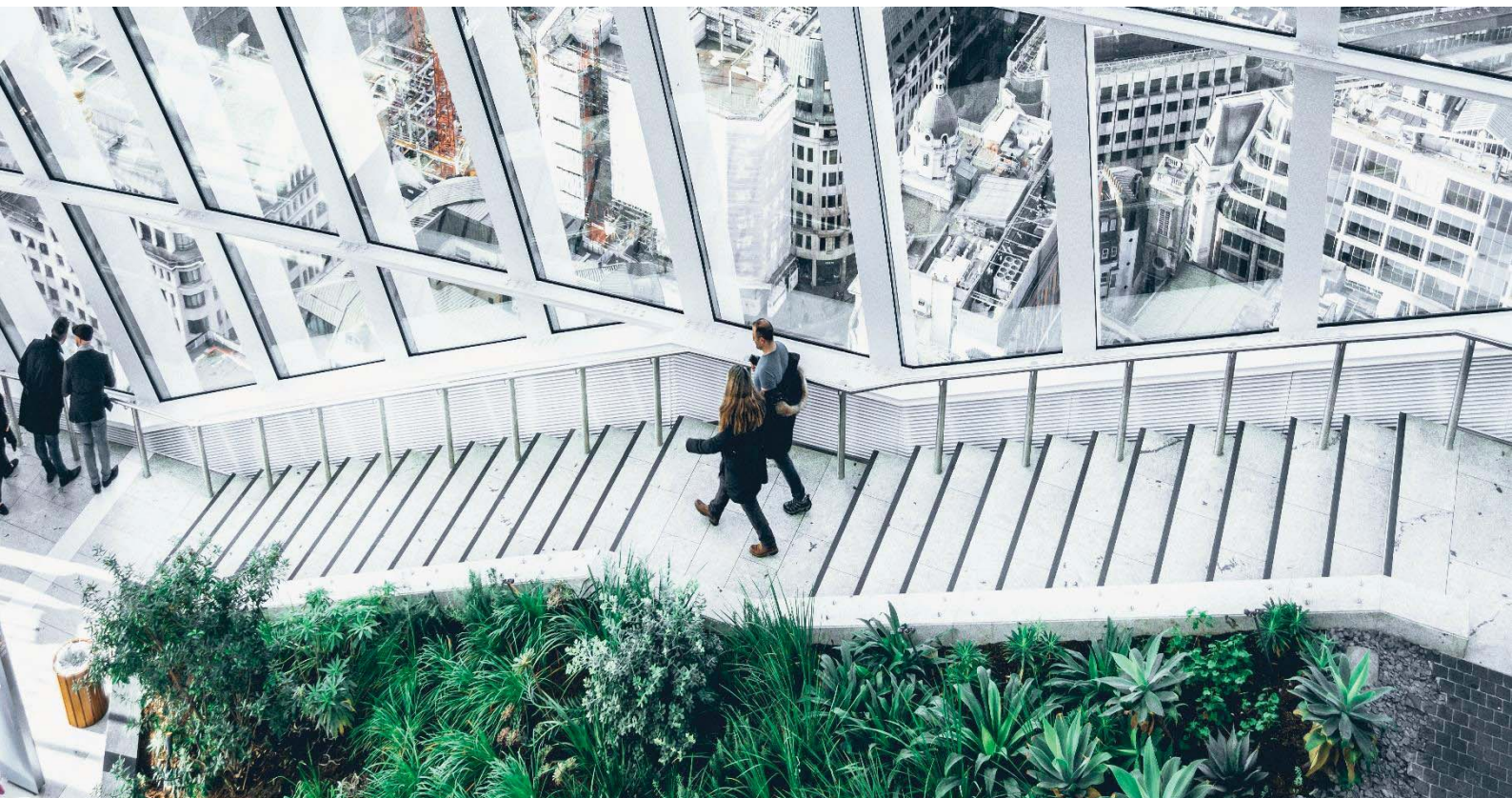
I think the health effects are positive in general. At the German post office where the first introduction of sit-stand desks took place, employees worked for 8 hours, sometimes with 4 hours until the next break. Sit-stand is the only solution there to get some movement. The first time we tried it, was with at German Television Station who planned a new office in Eastern Germany after the wall came down. We decided to start with standing at the beginning of the day and then allow sitting. They build multiple rooms for standing only. People would work for some time standing and then combine it with seated meetings later on in the day.

It is a lot easier to talk when standing, for example by moving you can more easily deal with emotions of customers then whilst sitting. People complain less about air and air conditioning when they stand, because when they stand they move a bit and do not get the same flow of the air continuously. We now provide users with wireless headsets and adjustable furniture that is easy to use in order to promote motion.

The problem with sit-stand desks is lighting. When you stand up you get much closer to the light source. As a solution we attach the lighting fixtures to the desk. Another issue is that you need a garage for the chair. What do you do with the chair when you don't use it? It is not an issue when you have 20 m<sup>2</sup>, but if you have 7m<sup>2</sup> like in some companies, there is just no space for the chair when you stand.

## Q11: In Germany there are strict regulations for office workers. What is the most important one in your opinion?

The most important rule is having visual contact with the outside, while it has a direct link with health. Studies have shown that in hospitals recovery is faster when having a good quality visual connection with the outside. This first study we performed on this topic with office workers was in 1990 and had about 3000 users. The results have been replicated in even larger studies later on. In these studies, we asked workers about the distance between their desk and the next window. All reported health issues were correlated to this distance. People who sit within two meters of the window reported the least number of health issues, although temperature and noise levels are worse next to the window. In interpretation of Aschoff's research, we postulated that this must have to do with circadian rhythms and natural defense reactions of the human body. The body can function better when it receives circadian information through daylight.



## Q12: In the Netherlands we have a lot of buildings which consist entirely of glass. What is your opinion about that?

It never works because you cannot get the energy out of the building and it gets too hot inside. The light standards made by my former professor say that if you have a daylight factor beyond 8% (more than 8% of the illumination level outside), then you will have thermal issues. Modern buildings have too much glass. In order to cut energy coming out they filter out parts of the light spectrum. The windows look greenish like an aquarium because they cut off blue and red. Even plants in offices suffer from such practices.

Energy savings and healthy radiation are somewhat the opposite if people spend much time in interiors. Normal window glass filters out UV radiation almost completely. UV radiation and infrared have been excluded from the definition of light in 1925. Thus, even the same level of light in interiors does not mean that the inmates receive any UV radiation. However, UV radiation is essential and vital for your health, via our need for sufficient levels of Vitamin D. You need to make sure people get outside 10 to 20 minutes during noon time. The strange thing then is, that due to energy saving focus in Germany there are radiation rules for office green, because plants will die in offices when they do not get enough radiation other than light!



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