Computerphobia in Adult Learners

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With the increasing importance of technology in our lives, incidences of adults experiencing anxiety about technology ('technophobia') are on the increase. The field of technology that has advanced most rapidly in the last 40 years is that of computers and micro-electronics. Thus, 'computerphobia' (or 'computer anxiety') is a particularly striking example of the effects of the rapid growth of our technological society. Though computerphobia can affect young and old alike, it can be considered different in adults and children for the same reasons that education can be considered different for these groups. For example, Knowles [12] cites differences in self-concept, in experience, in readiness to learn, and in time perspective as some of the main attitudes distinguishing learning in children and adults. For many years no distinction was made between the education of adults and the education of children, but educational theorists such as Malcolm Knowles have spent a great deal of time trying to convince other educators of this distinction. Only relatively recently has *Andragogy* [12], the art and science of teaching adults, been distinguished from *Pedagogy*, the art and science of teaching children. Analogously, these differences are also found in the effect of and cures for computerphobia:

self-concept — children tend to 'brush-off' failure, adults do not;

experience — "To an adult, his experience is him"—thus, if an adult cannot master some discipline, their experience and consequently their self-image are questioned;

readiness — children are often more willing and more able to learn and accept new ideas than adults;

time — children are often unafraid of failure as they feel they can always learn later; adults are less likely to feel that they can 'get it right later'.

Thus, the reduction of computerphobia in adults can be seen as a specific kind of adult education. Further, curing their anxiety is often seen by the adults themselves as a form of education. They seek to improve themselves (for whatever reasons, see section) by reducing their phobia while increasing their knowledge and competence. In undertaking such a task, the degree of independence and self-motivation is usually quite high.

In this essay, I will attempt to relate some of the causes and symptoms of computerphobia and evaluate, from an educational point of view, some of the solutions that have been proposed. I will begin by uncovering what the underlying causes of computerphobia are.

What causes Computerphobia?

The rapid advance of technology is having profound effects on all aspects of life. Regardless of background, people realise that technology is affecting them in unexpected ways. Computers, in particular, are a field where even experts are surprised by the rapidity of advances within their own subject. The advance of the computer age is a prime example of a situation where major cultural changes have occurred within the lifespan of the average adult. Thus, adults are faced with the that they were never taught about the fundamental aspects of the current technological society. This corresponds to what proponents of the adragogical view cite as one of the main reasons for considering adult education as a separate, specialised branch of education. Knowles [13] in particular suggests says that as changes in technology become more frequent, adults must start to learn all about the new societies that emerge that are based on new technologies. In computer science, where far-reaching changes occur about once every ten years, this need to re-educate adults and to reduce their computerphobias is even greater.

One of the root causes of computerphobia is that the rapidity of technological advance, together with a tendency to install technical progress as the highest value in the present technological society have given the impression that artifacts such as computers are more valued than people. In this age of increasing technology, this reflects the dehumanising effect often felt by adults.

Jay [9] describes some other causes of computerphobia amongst adults, i.e.,

1. a failure on the part of the phobic to 'keep-up' with technological advances,
2. failure of the phobic's workplace to consider his/her job when planning new technology,
3. failure of institutions to provide incentives to workers to keep up with new technology.

Other researchers have cited various other causes of computerphobia: Berkeley [3] suggests that because the computer can be seen as a piece of mathematical technology, fear of computers can be seen as an extension of fear of mathematics. Many people go through life having at least a little fear of mathematics (arithmetic, really). Many adults gladly ignore as much as possible about numbers and figures. Often these phobias are due to the "learn your times tables" school of mathematics education. Though most people can manage without resorting to too much mathematics, avoiding computers is becoming increasingly difficult and may be virtually impossible in the future.

Ewing et. al [7] cite the physiological problems associated with age (e.g., being unable to type quickly) as alternate causes of computerphobia. These problems have been extensively studied in the area of adult education, for example Cross [6] describe learning as a function of ageing.

Widmer and Parker [23] show that in spite of their 'better' education, educators themselves are equally prone to fear of technology. They (and adults in general) often back away from activities that that will embarrass them such as trying to explain computers when they themselves know little about them and fear being shown-up by computer 'whizz-kids'.

Bostock et. al., [4] suggest that even if learning about computers is attempted, 'anxiety barriers' often exist between the students and 'expert' tutors. As this suggests, most adult classes in computing are carried out by having one 'expert' explaining to a class of learners. In such a situation, priority is given to the efficient transmission of information from the teacher to the learner, rather than to the understanding or fulfillment of the student; this approach is usually termed the *communication approach* [10]. Very little interaction is encouraged in such situations and even if it were, little would be possible due to the constraints on the learning environment usually found in computer classes. This lack of interaction between learners is termed learning in *individual transactional mode* [5]. The learning environment for computer courses (e.g., isolation of students at terminals) and the lack of teachers who are competent in both adult education and computer science can also lead to phobias in students taking such courses [4]. Finally, all these problems are particularly acute in women and low-pay groups [1].

Wilcocks and Mason [24] draw a distinction between two different levels of computerphobia. The first is 'mild' computerphobia, which, they claim, is often just a symptom of ignorance and unfamiliarity with the subject. The more 'chronic' computerphobia is really a psychological problem and has the clinical effects associated with phobias in general. Wilcocks and Mason claim that though the mild version may be widespread, there is only very little evidence for the second kind and suggest that there is not as much to worry about as some researchers suggest. This may be true, but solutions to 'mild' computerphobia still need to be found and techniques from adult education adapted to this problem. Curing the more serious computerphobia is beyond the scope of this essay and probably requires professional psychological help.

Kneller [11] suggests that some adults fear and/or hate computers because they find then 'rude and impersonal'. For example, receiving a

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Fatal Error...
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error message from the computer can be considered brusque, rude, and intimidating[1]. This can not only lead to dislike of the computer, but can then lead on to fear (e.g., "if I don't like it, perhaps it doesn't like me").

Thus, there seems to be no recognisable typology of learners who might be prone to computerphobia. Though lack of education may be a disadvantage, a good education does not necessarily help to avoid these fears.

[1] Such problems can be found throughout computing as the human-computer interface is (in general) not yet well developed. Borrowing a famous quote, computers were "built for speed, not comfort".

The symptoms of Computerphobia.

Many researchers have described the symptoms of computerphobia. Below is a list of such symptoms compiled from Jay [9], Maren [15], Kneller [11], and Wilcocks and Mason [24]. Mild computerphobia appears generally in the form of negative attitudes towards computers, such as

1. resistance to talking or thinking about computer technology,
2. fear and anxiety about computers,
3. hostile or aggressive thoughts or acts.

These general symptoms can take many specific forms, for example

1. fear of physical contact with the computer,
2. fear of touching the computer for fear of breaking it[2],
3. denial of the existence of computers (see 1 in general symptoms above),
4. feeling threatened by 'computer adepts',
5. feeling you've been replaced by a machine,
6. fear of loss of job status or job satisfaction,
7. feeling de-humanised (less human contact),
8. feeling aggressive towards computers,
9. rôle reversal—person assumes the rôle of slave to the computer,
10. not wanting to work with any 'logical machine' (a mild form of xenophobia).

The more 'chronic' form of computerphobia often exhibits symptoms classically associated with phobias. Such symptoms are anxiety when the subject is mentioned and physical effects when a computer is approached such as shaking, sweating, etc.

Motivation and function of learning

The motivation for undertaking a course of learning that attempts to reduce computerphobia is not always obvious. For instance, why does the phobic not just ignore the problem (this is assuming that the phobic only suffers from 'mild' computerphobia)? If he or she does not work with computers then this may be possible. Even though computers are becoming more and more widespread in their use they are often hidden inside 'simpler' objects. For example, though 'cash dispensers' are computers, people are rarely threatened by them (unless they go wrong). If the phobic does feel fear of such things then he or she may be suffering from a much deeper 'technophobia'.

Assuming the phobic is unable or unwilling to ignore their phobia, the reasons for embarking on an 'anti-computerphobia' course can be categorised as follows.

- *Personal reasons:*
  Often the phobic feels that their phobia is a "character defect" or at least something that needs to be rectified. Thus, the course could be intended to correct a perceived personal weakness. Such reasons, or even just wanting to learn more about computers without considering the phobia as a problem can be seen as humanistic or personal-growth motivations, i.e., where the student sees the aim of the learning undertaken as the development of 'self' [10].

- *Social pressures:*
  Another reason for undertaking such a course of learning could be from 'social' pressures. If the phobic feels that everyone else feels at ease with computers then this will often lead the phobic to do something about their phobia to "avoid being left out". For example, Banks [1] shows that the ratio of women to men attending introductory classes in computing went up from 27% to 35% between 1981 and 1982. This rise was due to an increase in the number of housewives attending the classes. Their main motivation was their lack of comprehension of the 'computer-talk' being uttered by their families.

  As well as such family pressures, our categorisation of social pressures also encompasses 'peer-pressure'. Being told (or even suggested to) by a 'social peer' to take such a course may be a strong incentive to undertake it.

- *Work pressures*
  Motivation for reducing computerphobia can also come from the phobic's workplace. It can come directly, for example by being told

[2] Another famous quote is that the student is "afraid to touch the buttons in case I blow up Pittsburgh".

by your boss to become competent with computers. This may be because computers are being installed or maybe it is because it is company policy to make all employees 'computer literate'.

Motivation can also come indirectly from the mere fact that computers are (or will be) used in the phobic's workplace. In this case the phobic may be forced to use them or at least find them difficult to avoid.

The function of the learning experience to be undertaken can be categorised in several ways. Though the main objective of such a course may be to reduce computerphobia, the rôle that the learning experience plays is not so straightforward. For example, using the terminology described by Jarvis [8] the function of adult learning in this context can usually be categorised as one of the following:

- *'Second Chance' learning*
  Many people who suffer from some form of computerphobia have had some previous contact with computers. Often this will have been through an earlier course on computers, and it may have been at this stage that the phobic first recognised their phobia. Such a reaction may have been personal, but may also have been caused by a badly designed or badly taught course. Thus, a further course can be seen as a second chance to 'master' computers.

- *Personal development*
  Often, if the learning is undertaken because of a perceived personal weakness, the function of the adult learning is purely personal, i.e., purely for humanistic or 'personal-growth' reasons.

Having described the motivation for undertaking a course intended to reduce computerphobia, we will continue by describing some of the attempts at cures for computerphobia found in the literature. Several approaches will be described and analysed and tentative conclusions drawn from their results.

Curing Computerphobia through Adult Education

Several researchers have proposed methods of adult education to aleviate computerphobia. Jay [9] suggests that the cure for computerphobia lies in promoting a change in the attitude and behaviour of the phobic. This can be achieved by either of two routes:

1. The individual must instigate a course of personal education on the subject of computers, or

2. An environment must be provided in which the phobic is allowed to develop and change.

The first approach is just a self-motivated learning project with all the aspects of the educational process handled by the individual. The second approach implies using a more group-learning oriented approach rather than inactive learners participating via the communication approach to education.

The first method is regarded as being little help to computerphobics as it does not provide a supportive environment for actual physical contact with computers and learning to use them. As we will see below, this second method has been proposed by other researchers.

Vernon and Young [22] describe their experiences in a computer awareness project for factory workers. This project comprises of an on-site computer lab that workers can 'drop-in' to after and between shifts. The learning that goes on in this computer lab is generally client focussed but oriented more towards groups, i.e., the individual benefits from the educational experience, but the education is carried out in groups. Technology is approached through 'hands-on' activities that relate (if possible) to daily home and work life.

The holistic approach described by Vernon and Young is often purported to be ideal for encouraging and motivating adult learners, especially within such a technological field. Their approach shows a particularly successful open learning scheme.

With computerphobics, practical, user-friendly tools can be used to introduce the phobic to computers through practical examples. Maren [15] also proposes using practical, 'hands-on' applications such as word-processors and spreadsheets to overcome computerphobia.

Ewing et. al., [7] suggest that Computer Aided Learning should be used to teach adult computer literacy students. This involves answering questions and solving problems directly on the computer. They suggest that this approach is ideal for adult computer education as it is self-paced and generally self-contained (only external reassurance and rewards are needed periodically). Such an approach is not really suitable for computerphobics. Apart from the obvious problems of having to use a computer in order to reduce computerphobia, this kind of impersonal individual learning is the antithesis of the group learning approaches that have fared best in this area.

Kneller [11] suggests that computerphobia in adults is analogous to 'communication apprehension' amongst adult speakers. So, he describes how techniques used to cure stagefright can be adapted to reduce computerphobia in adults. Kneller comments on the earlier work by Jay (described above), suggesting that this work did not really develop techniques that get to the heart of the 'fear factor'. He describes six techniques derived from stagefright cures that can be used for computerphobics:

1. Change the name—'computerphobia' sounds too serious, so change the name to 'communication apprehension'[3].

2. Share experiences—use group therapy approaches to create an atmosphere where phobics can admit their fears. If they admit their fears and are shown that they are not alone then the fear will diminish. For example, Roger's work on encounter groups [18, 17] could reasonably be applied in this area.

3. Introduce computers gently—e.g., introduce useful applications, and especially use games.

4. Make the initial programs that are written relevant and useful.

5. Make sure the students carry out practice, preparation, and repetition in order to promote familiarity.

6. The teacher/facilitator should give regular praise and encouragement.

This approach exemplifies the humanistic, group learning approach to reducing computerphobia and is the best attempt discussed so far to tackle the basic fears of the student.

Like Jay, Tharp [20] suggests creating an environment conducive to a change in the attitude of the learner. However, he suggests that the main element of this environment should be motivation rather than any particular educational method. This motivation would enable the phobics themselves to overcome their phobias. Tharp gives a list of factors that encourage motivation to change in the student. These read like a list of pre-requisites for the good facilitation of education good teaching in any context.

[3] Though better than computerphobia, communication apprehension is still off-putting. This change of name is quite effective in the reduction of anxiety.

- interact with student,
- care for student,
- identify the student, i.e., treat the student as a human being,
- discuss things with the student,
- stimulate the student to think,
- build students confidence, e.g., with easy exercises,
- don't place student under pressure,
- never ridicule or embarrass student,
- provide early and continual feedback to student,
- make the objectives clear to the student,
- display an enthusiasm for the subject,
- make the course *fun*,

Though Tharp does not give any other details of his educational methods, the above does imply that there is a 'teacher' in the standard sense who is in charge of the facilitation of education. This implies that again the communication approach is used. This, though less attractive to educational theorists, is, as will be seen below, suprisingly popular with adult learners.

Berg and Poppenhagen [2] carried out a study of adult learning styles in computer education. They use a 'learning style inventory' that distinguishes the following four learning styles:

Converger—abstract conceptualisation and active interpretation.

Diverger—concrete experimentation and reflective observation.

Assimilator—abstract conceptualisation and reflective observation.

Accommodator—concrete experience and active experimentation.

Adult learners taking introductory computer courses were asked which, if any, of these categories their own personal learning style fitted into. Suprisingly, the results showed an even split across the categories. One implication of this is that many adults approach even mechanically oriented learning tasks from a theoretical or conceptual point of view. Thus, in the context of adult computer literacy, the distinction between training and education is not applicable.

In the same study the adult learners were asked which learning method they preferred. 60% said their preference was to be taught by a combination of classroom instruction and programmed material, while 80% of the sample said they would not select a didactic learning experience as their only learning method!

Though the adults questioned were not necessarily computerphobics, they were all computer novices so these results give some weight to the view that the success of the educational process depends more on the ability of the teacher than on the teaching method used.

Finally, there are some general problems in computer education for adults that are also problems for computerphobics. Bostock et. al., [4] investigate the effects of the learning environment and the students gender on attainment in adult computer literacy classes. They found that the use of computers forces isolation on the students as computer terminals tend to be isolated from each other. Though interaction between students was encouraged and group discussions instigated, it was found that the computer use tended to make the students maximize student-computer interaction whilst minimizing student-student interaction.

When students were forced to share computers and thus to discuss their problems, their understanding improved. Women improved significantly in a less formal atmosphere where co-operation was required but suffered in this situation if interaction with male students was necessary.

These results have a bearing on the reduction of computerphobia, especially where women are concerned. Ideally small, single sex groups should be used in a group learning situation and members of these groups should each share one computer terminal. This limits gender problems and minimizes feelings of isolation.

Conclusions

Before drawing conclusions from the methods outlined in the previous sections, there are several problems with these methods and other possible solutions to computerphobia have not yet been employed:

- There is a problem with choosing examples on the computer that are relevant to everyones everyday life, because usually we are only the 'end-users' of computers and are not directly involved with them. Even choosing example applications such as word processors and spreadsheets could be foreign to many people. Also, games on the computer may have the same problem (though the idea of attempting to use them to introduce computers gently is a good one).
- One of the best ways to reduce computerphobia is to select some problem that the student want to solve. For example, if the student is interested in genealogy, then constructing a family tree program may be appealing. Once the student is 'embroiled' in a problem of their own choosing, it is much easier to 'forget' about the computers presence. One of the the worst ways to learn about computers is to be forced to do "artificial problems".
- Many adults feel worried about making mistakes on computers. This often stems from being afraid to be wrong (sadly, this attitude often occurs in schooling), but it is an essential part of using a computer, so the phobic must be convinced that no harm will come of making mistakes. Discussion and learning groups with a facilitator co-ordinating the learners' experiences are a particularly successful method of relieving this fear. This type of humanistic group-learning has been advocated particularly by Carl Rogers [16].
- The objectives of the learning process are usually personal. The learning process has been successful when the adult feels at ease with computers.
- As there is such a wide variety of levels of knowledge about computers and of levels about computerphobia any educator must really act as counsellor/mediator/facilitator rather than teacher. This again suggests the facilitation of learning through groups.

Overall, there were dissapointingly few educational solutions to the problems of computerphobia in the papers described earlier. Most just suggested using normal teaching methods but using more practical and everyday examples. There may be some reason for this as the results of Berg and Poppenhagen [2] suggest that the more 'andragogical' methods were not very popular with the students. Many of the approaches used seemed to be not very successful in tackling the problems of computerphobics. This lack of success may be due to the instigators of the methods not having enough background in both adult education and computing: those with computing backgrounds tend to think that all education is just a question of standing up in front of the class and teaching and have very little regard for any of the research into learning processes; those with a background in adult education seem to think that when they have understood the theories concerning adult learning and learning processes, these are immediately applicable to any subject—they do not realise that each subject is different. For example it has been widely accepted for a long time that mathematics education is often very different from education in other subjects. Computer education is similar but, because of the 'mechanistic' element, is even more unusual.

One of the impressions gained from reading these papers is that though there is still a large individual/personal element involved in reducing computerphobia (for example, self discovery and perspective transformation), the behaviourist model of learning[4] is not wholly appropriate; the individual needs to be able to develop and interact freely with the computer and overcome phobia personally.

Although the freedoms of individual learning, such as self-pace, alternate learning paths, selection of learning goals, and freedom of access are important, the real cures for computerphobia seem more likely to be found using combinations of group and open learning. Open Learning (such as that described by Lewis [14] and earlier in this essay reported from Vernon and Young [22]) or other flexible approaches seem most appropriate, though problems with the learning environment can cause difficulties. As described earlier, the learning environment is not always conducive to either open learning or group learning. However, open learning often restricts the possibility of group learning approaches being used. This need not be true in the context of open computer labs as described by Vernon and Young. Here, group approaches can be used, though the members of the group may change constantly.

Group interaction seems to be essential. Autonomous learning or learning in an individual mode is unlikely to solve the core fears of computerphobics. Kneller [11], in particular, expounds the group approach, suggesting some form of 'group therapy' where the purpose is 'fear abatement'. Such groups would be more like humanistic learning groups than encounter groups. They would provide a supportive environment with a facilitator involved and flexibility and nondirective teaching encouraged. Such conditions correspond reasonably well to Rogers characterisation of the humanistic learning model [16] as the students

1. control their own learning,
2. choose their own goals,
3. accept responsibility for what happens,
4. use the teacher as a facilitator.

One problem with this is in finding suitable facilitators for such groups, i.e., those educators who show particular empathy for their students. Anything else may not be appropriate for computerphobics.

Though 'group learning' is the vehicle for the reduction in computerphobia, the achievement is personal. Computerphobia is initially a *product* objective of group learning (i.e., doing something simple and concrete and practical), but culminates as a *process* objective (i.e., resolving computerphobia).

Finally, the organisation and instigation of such computerphobia courses seems to be largely on a group basis. Only Vernon and Young [22] describe an approach where some company or institution is actively encouraging such courses. Hopefully, this will change in the future.

[4] The behaviourist model of learning, popularised by Skinner [19], is characterised by heavily programmed instruction and strict control of learning activities.

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