

Given that disasters create opportunities for active learning, why do they repeat?

Introduction

The title of the essay implies, that disasters create opportunities for active learning. Nevertheless disasters do repeat. The aim of this paper is therefore to analyse the limitations of active learning and to identify causes for the recurrence of disasters.

While a wide range of limitations of active learning are mentioned in the following explanations, the essay focuses on showing the significance of three specific theories.

The theory of risk society as explained by Beck (1992, 1998) and Giddens (1998, 1999), the actor-network theory (ANT) as discussed by Callon & Latour (1981), Latour (2005) as well as Law (1992) and the importance of the normal accidents theory (NAT) as proposed by Perrow (1999) are used to uncover contexts that inform the argument presented in this paper: The concept of active learning needs to be understood and applied in a more holistic way to meet the extensive nature of contemporary risks.

To address the holistic approach, the essay is not focussing on a specific case study to support the argument, but offers a selection of well-known disasters that continue to occur. Whether the incident is a terror attack, a flood or an airplane crash – certain characteristics are comparable and allow general conclusions that should be considered in active learning.

The essay starts the debate on discussing the characteristics of the term 'disaster' in the light of Turner's (1978), Dombrowsky's (1995) and Gilbert's (1995) ideas. The theory of active learning with its limitations is enlightened on using the explanations given by Toft and Reynolds (2005). In the same paragraph, the three theories used to support the argument are introduced. After a brief overview of the chosen case studies, the analytical section discovers the characteristics of repeating disasters and discusses their implications for active learning. The discourse is closed on considering a practical application of enhanced active learning.

Conceptual framework

Having outlined the general direction and structure of the essay, the main terms shall be analysed and the related theories debated in details. The term 'disaster' describes a phenomenon that has been and still is fundamentally discussed. On one hand the academic discourse aims to clarify the differences or similarities of events with comparable characteristics such as accidents, emergencies or crisis. On the other hand, efforts are taken to establish a system that enables the comparison and classification of events identified as to be disasters. These intensions are confronted by a number of challenges and are discussed by the Institute of Lifelong Learning (2008) in Module 1, Unit 2: 2.2. It is noted that the major difficulties include the differing reasons why such events occur as well as our differing perception of them, the changing context they occur and finally the fundamental problem to obtain reliable data that would allow a better understanding of the subject matter. An interesting aspect in the discussion is the notion that such catastrophic events are subject to a morphologic nature. What might look like a manageable emergency can subtly transform to a more serious event, which becomes too complex to manage and simply takes its course. This idea is reflected in Turner's (1978) approach of disasters emerging from initial failures or wrong presumptions about a specific situation, system or organisation. This constitutional misunderstanding leads to further misjudgement of operational difficulties that are accepted as normal. Turner's model can be seen as a chronology of misinterpreted or unremarked events that finally create what he calls an 'ill-structured' event: A situation where the application of predetermined action plans and procedures is not appropriate anymore. Turner's concept implies that disasters do not occur as 'acts of God' (Toft and Reynolds, 2005: 24) but must be accepted as failures in so-called socio-technical systems (Ramage and Shipp, 2009; Trist, 1981). In other words: disasters occur where humans and technology are engaged but not interacting appropriately. This point of view is in line with Dombrowsky (1995: 244) who observes: "Disasters do not cause effects. The effects are what we call a disaster." He encloses the example of an earthquake, which is nothing more than a natural phenomenon. The catastrophic consequences we call a disaster are caused by the failure of socio-technical systems to encounter such phenomena. Gilbert (1995: 234) finally proposes the term 'social vulnerability' to paraphrase disaster. A quite suitable definition as it will be shown later.

The essay title implies that disasters are opportunities for active learning. The theory of active learning is part of Toft and Reynolds discussion about general and specific organisational learning (2005: 65-114). They identify different levels and types of learning. Active learning is described as a type of learning that does not only recognize deficiencies, but takes immediate action to remedy shortages and therefore enables active foresight. Toft and Reynolds later on explain that active learning implies that a working feedback system is in place, which continuously compares the socio-technical system's output against pre-set goals (2005: 89). To achieve the desired output of active foresight, which is the aim of an active learning system, specific internal and external inputs are required. These requirements are identified as to be foresight (coming from hindsight) and safety by compulsion as external input and the availability of information, the possibility of implementation of regulations and the correct initial interpretation of the situation as internal input. What does this mean? To avoid the recurrence of a disaster in a socio-technical system, it is necessary that the system is supplied externally with valuable information of what happened, together with strong demands for better safety. Internally, this information and demands must be recognised, understood and adequate action be applied.

If lessons learned to avoid the recurrence of disasters must be applied beyond what can easily be identified as socio-technical system, the appliance of active learning becomes increasingly difficult. To better encompass these limitations, Beck's (1992, 1998) and Giddens' (1998, 1999) explanation of what they call a 'risk society' are helpful. Beck (1992: 21) notes that a risk society is characterised by a systematic way of facing hazards and insecurities, which are emerging from modernity. Giddens (1998: 25) expands this notion on stating that a risk society lives "... on a high technological frontier which absolutely no one completely understands and which generates a diversity of possible futures." This implies a wide range of limitations for active learning: If we do not understand what is going on, how should we even produce hindsight not to talk about generating active foresight? And how shall we demand better safety if we do not know what is safe? And finally: If we don't know the consequences of the technology we are living with – who is to take adequate action to remedy deficiencies? Beck (1998: 10) and Giddens (1998: 26) state that two linked processes, the end of nature and the end of tradition give way to the risk society. The end of nature signifies the physical world, which can hardly be separated from human interventions nowadays. Best examples, among others, to illustrate this

notion are the climate change, the continuous disappearance of species or the increasing resistance of bacteria to antibiotics. The human intervention in nature causes new risks difficult to assess because we cannot conceive the complexity of causes, effects and interdependencies. The end of tradition as second process, coupled with risk society is described by Beck (1992, 1998) and Giddens (1998, 1999) as individualisation process and breakup with roles and values that have been taken as granted before. Starting from changing gender roles or new forms of employment and family to the maceration of nationalities: The ongoing transformation of the society makes it difficult to identify who is part of which socio-technical system and in what function.

So far it was explained that disasters are occurring if interactions of humans and technology are malfunctioning. It was also said, that disasters can be seen as social vulnerability. Furthermore the preconditions for active learning were specified and it was noted that contemporary society, facing the end of nature and tradition does not have the capacity to fulfil these requirements. Does this explain why disasters repeat? It is not possible to answer these questions until disasters do not repeat anymore. Nevertheless it must be discussed how our society can overcome its current uncertainty regarding risks and responsibilities in order to better apply active learning. The actor-network theory (ANT) as discussed by Callon & Latour (1981), Latour (2005) and Law (1992) as well as the normal accidents theory (NAT) as proposed by Perrow (1999) can be used to discuss a new understanding of active learning. Law (1992: 379) posits that the actor-network theory treats any kind of social relations as network effects. The uniqueness of the approach is that the so-called 'actants' in the network are materially heterogeneous and never complete, autonomous or final. Actants can be human, objects but as well concepts or interactions. These actants are constantly patterning, assembling, ordering or resisting, a condition that is called 'translation' (Law, 1992: 386). As Law (1992: 390) puts it: The theory in fact "... demystifies the power of the powerful" because it sees alteration as a main characteristic. Regarding the concept of active learning this implies, that actants first must be recognized and secondly the prevailing condition must be identified before it can be tried to remedy deficiencies and to head towards active foresight.

Before moving to the case studies that will illustrate the conceptual framework, the theory of normal accidents (Perrow, 1999) shall be added as one way of rethinking active learning. Perrow (1999) claims that failures are inevitable in complex systems. He notes that the degree

of interactivity and coupling accounts for the systems complexity. Considering phenomena such as terrorism, climate change or gene technology which are some of the subjects of concern nowadays, it becomes obvious that contemporary risks are emanating from highly interactive and tight-coupled systems thus, according to Perrow (1999), failures and therefore the potential for disasters are inevitable. Considering this idea, it must be questioned if our efforts to avoid disasters are a waste of time and resources.

Before a selection of case studies, to illuminate the presented theories are introduced, the findings so far shall be summarized. The essay asks why disasters do repeat if they represent opportunities for active learning. On using the concept of risk society (Beck, 1992, 1998; Giddens, 1998, 1999), the actor-network theory (Callon & Latour, 1981; Latour 2005; Law, 1992) and the theory of normal accidents (Perrow, 1999) the limitations of active learning were illustrated: Contemporary society is shaped by uncertainty, complexity, interactivity as well as morphology and therefore prone to failure. Active learning as described by Toft and Reynolds (2005) though does not account for such elusive structures, which can better be described as networks than as closed systems. Dombrowsky (1995) and Gilbert (1995) are kind of visionary if they paraphrase disasters as effects and social vulnerability: Disasters do not 'hit' from the outside, they are inherent in complex network structures and should be seen as actants with specific characteristics that affect the network. This is what is shown in the analytical section of this paper: Active learning must become itself an actant inherent to the network and try to influence the power structures by translation.

Examples of recurring disasters: floods, airplane crashes and terroristic acts

Before we move to the analytical section, the case studies to illuminate the presented argument shall briefly be introduced. To substantiate the argument of similarities in repeating catastrophes, the essay does not focus on a specific case study but offers three examples of floods, airplane crashes and terror attacks.

On 29 August 2005 hurricane Katrina passed New Orleans, bringing strong wind, storm surge and heavy rain. This resulted in the overtopping and breaking of large parts of the city's levee

system and the outage of the pumping stations to remove water from the city (The White House, 2006). 80% of the city was flooded causing damages to 70% of all housing units, displacing over 600,000 households over weeks or months and causing almost 1000 deaths (The Data Center, 2014).

From May to July 2007 the heaviest rain was reported in the United Kingdom since rainfall records were started to be collected. The rain was inducing floods from rivers but mainly from surface water and resulted in what is known as the Summer Floods 2007, leaving behind 55,000 flooded properties, half a million people without mains water and electricity and 13 deaths (Environment Agency, 2007; Pitt, 2008).

Following a generally wet spring with already saturated soil, heavy rainfall during one week in May and June 2013 caused the highest flood stages in Central Europe since reliable records are available. The total economic losses are estimated to be between 11.9 and 16 billion euros. Beside of the enormous costs, the floods caused 25 fatalities and forced – alone in Germany along the Danube and the Elbe river – an estimated 52,000 people to leave their home (Zurich Insurance Group, 2014a; 2014b).

In July 1996, a Boeing 747 operated by Trans World Airlines (TWA) and on its way to Paris, exploded 20 minutes after take off in New York. The plane crashed into the sea killing all 210 passengers and 18 crew members. The final evidence revealed a technical failure as most probable error resulting in the disaster (Flight International, 1997; Institute of Lifelong Learning (2008), Module 4, Unit 5).

In July 2002 a passenger aircraft of Bashkirian Airlines collided with a DHL cargo airplane over Germany and killed all 71 persons on board. The causation of the accident was found to be deficiencies on a human, managerial and regulatory level of the concerned parties (Bennett, 2004; Bundesstelle für Flugunfalluntersuchung, 2004).

In February 2009 the Colgan Air flight 3407 crashed into a residence 5 miles afar the landing airport and killed 4 crew members, 45 passengers and one person on the ground. The immediate cause was determined as to be a human failure, which led to an aerodynamic stall that brought down the aircraft. Several additional deficiencies were identified as to be contributing factors (Bennett, 2012; National Transportation Safety Board, 2010).

Four planes were hijacked and used in a coordinated terror attack in the United States on 11 September 2001. Two planes hit the twin towers in New York, one the Pentagon building in Washington and one crashed in Pennsylvania, killing almost 3000 people. The attack was executed by 19 Arabs, who were identified as to be Islamist extremists (Featured Commission Publication, 2004).

The Bali nightclub bombing describes the event of three bombs devastating a nightclub area in Bali on 12 October 2002. The blasts killed 202 and injured about 350 people. This bombing has been attributed to members of a Southeast Asian-based terrorist network and led to 30 convictions (Gurtner, 2004; United States Department of Justice, undated).

The so-called 7/7 bombings on 7 July 2005 involved three explosions in the London underground system and a fourth explosion occurring later on the upper deck of a bus, killing 52 people. The attack was executed by three second-generation British citizen whose parents were of Pakistani origin. The fourth terrorist was identified as to be a British national of West Indian origin (Her Majesty's Government, 2006; 2012).

Identifying what happened to whom

With this collection of case studies, it shall be analysed what happened to whom and what similarities of the disasters can be identified. The analysis is informed by questioning the socio-technical system involved as well as by the investigation if the causes leading to the disaster were completely identified. If a socio-technical system is seen as to be concerned with interdependencies and to be striving to remain a steady state in an altering environment (Ramage and Shipp, 2009: 276) the different case studies of floods uncover different levels of socio-technical systems affected. Taking the flooding of New Orleans as an example, the breaking levee systems or the pumping stations that failed to work can be seen as a socio-technical system affected (The White House, 2006: 34, 134-135). But as well each hospital, public area, private house hold or the emergency services in New Orleans can be identified as to be a socio-technical system. Taking a more holistic point of view, New Orleans with all the mentioned and more subsystems stands for a socio-technical system. While on the level of the subsystems such as the pumping stations it is still possible to identify what belongs to the system and what has to be seen as the environment and therefore as an external element, this

becomes extremely difficult if New Orleans or the State of Louisiana are seen as affected socio-technical systems. Taking as another example for a more or less restricted system each household that has been affected by the Summer Floods 2007 in the UK, it becomes obvious that these systems are strongly depending on much bigger socio-technical systems such as the government who is responsible to set the standards for flood protection systems (Environment Agency, 2007: 15). The same difficulty of identifying the affected system(s) can be found for the 2013 floods in Central Europe (Zürich Insurance Group, 2014: 8-17) as well as for other incidents involving the effects of natural phenomena.

This ambiguity is also specifically striking for disasters involving terroristic activity. 9/11 2001, the Bali nightclub bombing in 2002 or the 7/7 bombings in 2005 – all disasters can be analysed as deficiencies in different levels of socio-technical systems. The twin towers, the night club in Bali or the London underground system might as much be seen as attacked systems as well as the human victims and their relatives, the concerned countries governments or the prevailing culture. If even a specific culture can be identified as socio-technical system that can be affected by disasters, Gilbert's (1995: 234) idea of social vulnerability as an appropriate description for such events is once more a remarkably precise term.

Considering aircraft crashes, the identification of the affected socio-technical system seems at first sight to be an easier task. Starting with the simplest consideration, every plane that crashes can be seen as the concerned system. But passengers and crew members can be identified as to belong to different socio-technical systems as well. A pilot might be a father and member of a labour union, a passenger could be a company's CEO and active supporter of a political party. The plane itself are constructed, tested and authorised by different institutions and run by other institutions that are themselves part of bigger associations. Who, finally is or are the affected socio-technical system(s) in the case of airplane crashes? Who is not part of the affected system and can give objective external information of what happened? Who finally has to implement lessons learned to avoid the recurrence of the disaster?

Questioning again these preconditions for active foresight, the enlisted examples of what can be seen as affected parties in the case of a disaster show that there are always different, often interlinked and dependent socio-technical systems involved. To create active foresight in such conditions, means to break with the concept of determined responsibilities, authorities and capabilities. This is where the concept of risk society as proposed by Beck (1992, 1998) and Giddens (1998, 1999) and the actor-network theory as considered by Callon & Latour (1981),

Latour (2005) and Law (1992) disclose their real significance. As it was explained earlier, risk society can be seen as the end of tradition and the end of nature. A transformation that goes together with changing roles, relations and values. This is a process supporting the actor-network theory that claims to look at social relations as network effects. The network creating these effects is never stable, complete or autonomous and consists of heterogeneous elements with changing importance, authority, responsibility and capabilities – an idea that can well be illustrated by the chosen case studies which show, that affected systems can not easily be identified and are never exclusive and ultimate.

Additional support for the idea to apply active learning in a more holistic way is offered by the analysis of the causes of contemporary disasters. Reconsidering again the case studies and asking about the reasons for the incidents, the same ambiguity as it was uncovered on trying to identify the affected system can be revealed. Analysing the described flooding, the causes for the disasters can be claimed to be breaking levees in New Orleans (The White House, 2006: 43), insufficient drainage capacity in the UK (Pitt, 2008: 6) or too saturated soil in Central Europe (Zurich Insurance Group, 2014b: 9). But with the same accuracy it can be argued that generally the inadequate measures of the government, the underestimation of the situation by the civilians or simply a natural phenomena was leading to the catastrophic effects. Looking at the enlisted terror attacks, the insufficient evacuation plans for employees working in the twin towers (Featured Commission Publication, 2004: 281), a missing operational crisis management plan in Bali (Gurtner, 2004: 58) or the underestimated likelihood of suicide bombing activities in the UK (Her Majesty's Government, 2006: 27) can be specified as possible causes for the disasters. Nevertheless, from a general point of view, also imperialism, inadequate integration policies and differing cultures can be brought up as explanations for disasters involving terrorism. Depending on the point of view, causes or triggers for disasters can be identified very differently. This becomes specifically obvious if analysing the enlisted airplane crashes. In the aftermath of the TWA plane crash in 1996 very different arguments of what caused the disaster were brought up. The event was claimed to be the result of terroristic activity, the result of reduced safety margins or the consequence of a technological failure (Institute of Lifelong Learning (2008), Module 4, Unit 5: 5-11). While in this specific case the last argument finally was generally accepted as most likely cause for the disaster, the triggers for the collision of the two aircrafts over Germany and the crash of the Colgan Air flight must be accepted as

cataclysmic reaction chain of managerial, procedural, human and technological deficiencies that finally gave way to the disasters (Bundestelle für Flugunfalluntersuchung, 2004: 117; National Transportation Safety Board, 2010: 155).

This combination of interacting elements giving way to uncontrollable reaction chains illustrates once more what Beck (1992, 1998), Giddens (1998, 1999), Callon & Latour (1981), Latour (2005) and Law (1992) are considering with the idea of the risk society and the actor-network theory: We do not know, what we are dealing with and we are part of a morphological network in which each actant is constantly changing its condition. Active learning as proposed by Toft and Reynolds (2005) is under this circumstances almost impossible – we do not know what lessons to learn and who has to learn the lessons.

Rethinking what happened to whom

A way out of the debated dilemma is offered by Perrow's (1999) theory of normal accidents, which can help to work towards a new understanding of active learning. If the society accepts its condition as a complex and morphologic network with a high degree of interactivity and coupling, it can at least be grasped that a complete understanding and control of such a network is not realistic. This awareness is the precondition for the recognition of failures as inevitable phenomenon that can trigger disasters – one time as much as several times. If disasters cannot be avoided, the focus of active learning has to be changed on reconsidering what happened to whom. Floods, terror attacks and airplane crashes do not happen to someone, they happen in interaction with anybody. The possibility of what is happening to whom is an inherent part of and an actant in a network. The way to encounter such morphological structures is to apply the same flexibility, adjustability and attention. This means – to talk again in terms of active learning – that external can become internal elements, regulating agencies can be at the same time executive agencies or implementation bodies might have the role of controlling bodies. Active learning thus becomes a process of constantly scrutinising the active learning process itself.

Conclusion

Before a practical application of this idea is considered, the findings shall be recapitulated. It was asked why disasters repeat if they signify opportunities for active learning. It was shown that the concept of active learning demands specific preconditions that cannot easily be met for contemporary risks and by contemporary society. Case studies were used to enlighten the difficulty of identifying what is happening to whom in disasters. With relevant theories it was shown that the acceptance of and the adaption to the complexity of nowadays life is the first step towards an understanding of active learning that better incorporates prevailing conditions.

One idea to apply active learning in a more holistic way is by institutionalising a global network of think tanks with heterogeneous and constantly changing members in which contemporary risks and disasters are debated. This network would probably be able to scatter lessons learned more efficiently as the participants of the think tanks are themselves in a state of constant transition of being sender or recipient, of being concerned or not, of having power or not regarding a specific subject matter. This idea remains to be concretised, challenged and probably simply tried out. A concept that answers the complexity of our world with the same complexity might indeed help to reduce the recurrence of disasters. Or to put in Gilbert's (1995: 234) words: To reduce our social vulnerability.

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