Management information systems supporting youth at risk and the hard to engage

D. Passey
Department of Educational Research, Lancaster University, Lancaster, LA1 4YD, United Kingdom

This chapter focuses on those who support the vulnerable, explores their support and intervention needs, and their current access to and interactions with technologies and associated data. At any one point in time, many individuals can be classed, albeit in very different ways, as being vulnerable, or at risk. These young people commonly need support, often involving mediators or support workers, who help to advise, guide, alleviate or to address factors that bring about, maintain or heighten their vulnerability. Two recent reports [1, 2] looked at how some categories of support workers in England used current technologies in their mediation interactions, and showed that technologies were not always currently used routinely and were not yet entirely sufficiently focused to match their needs or purposes. This chapter reviews findings from an international literature, highlights the greater potential for wider approaches to technological development in this area, and discusses how a new approach to types of data gathered could lead to wider forms of interaction, but that there are wide professional, ethical and social implications, which will need to be examined closely.

Keywords management information systems; development of management systems; those not in education or training; data supporting the vulnerable; technologies and support mediators; data to support mediators

1. Introduction

Youth at risk is raised as an issue by many agencies and governments worldwide. Cunningham et al. [3] in their extensive report commissioned by the World Bank looked at current and future issues concerning youth at risk in Latin America and the Caribbean (LAC). They defined youth at risk as: “young people who have factors in their lives that lead them to engage in behaviors or experience events that are harmful to themselves and their societies, and that affect not just the risk taker, but society in general and future generations. These behaviors include leaving school early without learning, being jobless (neither in school nor working), engaging in substance abuse, behaving violently, initiating sex at a young age, and engaging in unsafe sexual practices” (p.2). In this definition the authors point importantly to the fact that there are a range of key factors involved and that disengagement from education and training is itself recognised as one of those important factors. In summarising their findings, they indicated the age range at which behaviours are manifest: “risky behavior frequently begins in the youth years. Although adults engage in violent activities and very young children leave school, the first time that most people engage in these kinds of behavior is between the ages of 12 and 24”, and “the circumstances and actions that lead to overall inequality in LAC first emerge during the youth period” (p.3). In terms of the width of key factors, Thomas et al. [4], reporting outcomes of early interventions with youth at risk in the United Kingdom (UK), identified: “29 risk and protective factors. The risk factors fell into five main areas: family, school, community, individuals and peers” (p.6). Importantly, they also reported that: “More risk factors at the individual and family levels were identified (and more addressed) than at the school and community levels. This either suggests that individual and family levels are more important in determining behaviour or is simply a reflection of an emphasis in research and policy on personal responsibility and behaviour change.”

At any one point in time, many individuals can be classed, albeit in very different ways, as being vulnerable, or at risk. Within educational settings, certain educational limitations (such as low literacy levels, limited social or communication skills, and poor abilities to cope with emotional and stressful situations) are commonly associated with the vulnerable or ‘at risk’ (those who can be marginalised, not involved in social and community activity, not engaged in education or training, and perhaps not employed). To support and help to address these limitations, a common aid or feature for young people is an involvement through mediators or support workers (maybe employment advisors, counsellors, support or youth workers, or local community volunteer supporters), who seek to identify ways to alleviate or to address factors that bring about, maintain or heighten their vulnerability. These mediators or support workers are deployed within a systemic organisation and culture, comprising perhaps national policy, regional or local management, a range of support or voluntary bodies, and those focusing on educational or social concerns. Fundamentally, however, the young person is the audience (or, by some support groups, referred to as a client), and, as Cunningham et al. [3] say: “policies directed toward young people should be different from those for adults or children because young people respond to incentives differently” (p.3).

How does technology fit into this picture of youth at risk and background contributory factors, disengagement from education and training, and interventions to address issues arising? Certainly policies and practices to support young people at risk need to acknowledge the fact that the young people are likely to access and use technologies widely, as shown by Passey, Williams and Rogers [5], in a report for a government agency about young people not in education, employment and training (NEET) in England. To engage with young people’s uses of technologies, and to support
mediators and support workers in enabling and enhancing their interactions with the vulnerable, there are clearly roles for effective technologies. Two recent reports [1, 2] looked at how some groups of support workers across England use technologies in their mediation interactions with young people at risk, and indicated that certain technologies are not currently used routinely (such as those involving communication or social engagement) and that other technologies (such as data records on management information systems) are not fully focused to match mediator needs or purposes. Even the ways that data are gathered (from a variety of different sources, for example) or used (to apply to an individual’s learning needs and approaches, for example) are insufficiently focused for different and effective uses by all stakeholders (where policy makers need different presentations of data from front-line support workers, for example). Currently, the Passey and Davies report [2] indicates that data record keeping and tracking are the most common uses of technological systems, and while it is clear that such systems can help to maintain records that would otherwise be difficult to update regularly and periodically (see the issues and techniques that needed to be adopted by McCuller et al. [6], when undertaking a 5 year study involving periodic reviews of high-youth risk, for example), it is clear that there are other important ways that technologies can be used more effectively; these will be highlighted and discussed within subsequent sections of this chapter.

At the outset, it is important to recognise that youth at risk is not a single homogeneous group. Knowing more about how the different constituent groups within the wider youth at risk populations can be positively supported has clear potential value for the different key stakeholders (policy makers, national agencies, regional and local agencies and support groups, mediators and support workers, as well as the young people themselves). Although categories of factors leading to learning exclusion and social exclusion have been categorised [7] for support purposes and will be discussed later, the support for young people at risk involving an integration of the roles of support worker mediators, lifelong learning practices and information and communication technologies (ICT) are only just beginning to be explored (as explored in a European Union (EU) context by Haché and Cullen [8]). Specific data about each of the different groups of youth at risk are just not available currently, and certainly not in forms that allow easy levels of comparison, such as across EU Member States.

2. International and European perspectives of concern

Although definitions of vulnerability or at risk can vary, and indeed ‘the condition of vulnerability’ can be affected by external influences (Collins [9], for example, identified school effects as exacerbated vulnerability), numbers of people at risk are often used as an important indicator of national well-being, and an identifier of needs for social policy. Figures from research and policy sources highlight rising international concerns about youth at risk. Although primary factors that lead to instances of youth at risk may not in themselves arise directly from education, training or employment (as indicated by Collins [9] and Schneider et al. [10]), it is clear that factors do relate in secondary ways; the influence and impacts of alcohol and drug abuse, substance use, sexual issues, criminal and physical abuse activities, and homelessness, clearly impinge on attitudes and levels of engagement of young people in education.

Figures about youth at risk that are being identified suggest that the numbers of youth engaged in risky behaviours is increasing, but the proportions in some cases are remaining the same. The Youth Risk Behavior Survey data [11] from the United States (US) indicate that between 2007 and 2009, at a .05 level of statistical confidence, incidences over a 30 day period of carrying a weapon on at least 1 day, not going to school because of feeling unsafe on the way or the way home on at least 1 day, attempting suicide one or more times, and using marijuana one or more times did not change, but having a drink of alcohol on at least 1 day had decreased. These data show lack of proportional change in the prior four cases over a 2 year period, but these data do not show how the same young people were involved, and their relationships to increases at certain times and over certain periods or to decreases, for example. Numbers of young people at risk of social exclusion in the EU are referred to in the Renewed Social Agenda (Commission of the EC [12]), which puts the number of young Europeans aged 0 to 17 years at risk of poverty at 19 million and the number of school dropouts (those who cease to attend) at 6 million. Regarding levels of education achieved by these young people, the Commission of the EC [13] says that: “Nearly 80 % of young people between 20 and 24 in Europe have completed upper secondary education. Nonetheless, a quarter of 15-year olds are low achievers in reading literacy and 6 million young people leave school without any qualifications” (pp.4-5).

In supporting youth at risk, a variety of support workers deal with needs both reactively (identifying and addressing past and current contributory factors), and pro-actively (considering and supporting the future needs and prospects of young people). In this latter regard, young people are perhaps highly susceptible to at risk situations as they have had more limited lifetime experiences, including those important ways to engage and communicate with key ‘providers’ (who might be training agencies, employers, or just those who have ideas that the young people might find worth pursuing). Many support organisations nationally, regionally, and locally work with young people at risk to address this need, through programmes, projects and initiatives that include after-school clubs and mentoring, job-seeking support, and community or youth centre involvement. These initiatives and groups are often funded at national, regional or local government levels, but evidence and intelligence about their forms of involvement and details about positive interactions and forms of engagement with an individual often remain at the local mediator and support level. Local mediators and support workers often use particular ways that enable them to interact positively with quite specific target
groups (they might be school dropouts, young offenders, those who are homeless or at risk in their home environments, or those who have cognitive needs, for example).

At a European level, to further support the work and actions of mediators and support workers, the ‘European Platform against Poverty and Social Exclusion’ [14], emphasises the importance of development and innovation, in order to make social services ‘more effective and responsive to new social needs’. European initiatives, the i2010 Action (A European Information Society for growth and employment) [15], and the ‘Digital Agenda for Europe’ [16], clearly position ICT as being a driver in terms of supporting an inclusive society. With information and services becoming increasingly available in digital form (sometimes now exclusively), it is clear that digital literacy becomes an important requirement, to enable citizens to engage in an e-Inclusive society.

Overall, technologies are being seen to offer potential support in three different areas: recording and awareness raising of early contributory factors likely to lead to at risk situations; the development of digital literacies and their use in supporting wider engagement with educational and training content; and the recording and awareness raising of current and future opportunities appropriate to the interest and needs of the individual young person. Effectiveness for young people at risk is likely to be concerned with the detail that is inherent and considered within each of these areas, and the linking and seamlessness when handled through mediators and support workers.

3. Those at risk and their learning needs

It can be argued that all individuals are vulnerable, that individuals encounter risk throughout their lives and adjust and respond, proactively or responsively, to situations and possibilities, to attempt to reduce their vulnerability, and maintain their stability. Maslow [17] considered this from a motivational perspective, of individual needs, and constructed a now classic hierarchy, which highlighted the need for a fulfilment of needs from the lowest level before the needs of successive levels could be considered and met adequately. The five levels he described were: physiological (breathing, food, water, sex, sleep, homeostasis and excretion); safety (security of body, of employment, of resources, of morality, of the family, of health and of property); love and belonging (friendship, family, and sexual intimacy); esteem (self-esteem, confidence, achievement, respect of others, and respect of self); and self-actualisation (morality, creativity, spontaneity, problem solving, lack of prejudice, and acceptance of facts). In considering this hierarchy, it is clear that mediators and support workers are often confronted with the dilemma of having to address contributory factors that create vulnerability that are at low levels of motivation need, while their desire to socially include the young people is on a focus of needs that are often at much higher levels (such as problem solving about employment choices).

The importance of identifying factors contributing to at risk situations as well as identifying positive interventions to support those individuals, and handling the complexity of the situation that can arise, is well exemplified by the findings of a study of Schneider et al. [10], exploring the long-term implications of women taken out of their homes. They concluded that: “women with a history of out-of-home placement experience a multitude of problems, including PTSD [post-traumatic stress disorder], poor health, smoking, and obesity. Educational and economic disparities between women with and without a history of out-of-home placement also emerged. Relative to other women, those with a history of out-of-home placement were less educated and more likely to be unemployed, living in poverty, and receiving public assistance. Overall, findings underscore the need for greater access to mental health care and social services for youth in out-of-home placement to improve their long-term health and economic well-being” (p.443).

These findings suggest the needs for early awareness of contributory vulnerability factors, early intervention, and sustained support.

Features of vulnerability vary across different social and community contexts, but there are eight broad groups of features associated with individuals who are vulnerable within school settings [7]: physical disabilities or deficiencies, where some form of personal or individual attribute can limit or make physical access difficult in some way or ways; physical presence, where, for a range of reasons an individual may not be physically present within a particular context; cognitive attributes, where personal attributes and abilities might limit certain types of cognitive engagement; social features, where personal attributes might make social interactions with others difficult or limited; emotional features, where a personal emotional state might limit interactions or attention; behavioural features, where personal behavioural attributes might make interactions or physical presence difficult to handle; geographic presence, where personal location might not make attendance possible; attitudinal features, where personal attitudes might limit levels of interest, attention or interactions; and opportunity factors, where personal location or lack of attention might limit the taking up of opportunities arising. Data is known about young people in some of these categories, but not in others. Across this broad grouping of eight features, data is available in England (a country with high levels of data records in schools) about the numbers of young people in the 5 to 19 year old age range, in terms of: physical attributes, there are specific data on those with physical disability, visual impairment, hearing impairment, absence or exclusions from school, those in prison, or hospitalised, but there are no specific data available on those with motor access difficulties, those who are home tutored, in motherhood, those involved in family care, or homeless; for cognitive attributes, there are specific data on those with autism, but there are no specific data available on those with specific cognitive difficulties (other than overall figures showing those with specific, moderate, severe, profound, multiple or communication difficulties), dyslexia, dyscalculia, Asperger’s syndrome, or Down’s syndrome; for social attributes, there are specific data on those
with social disadvantage (if free school meals is accepted as a useful indicator), language barriers (if those with English as an additional language is accepted as a useful indicator), those who might experience ethnic or cultural barriers (if those with cultural backgrounds other than white British is accepted as a useful indicator), criminal activity, or drug and alcohol abuse, but there are no specific data available on those who are marginalised, or who have low levels of social or communicative engagement; for emotional features, there are no specific data on those who are shy, withdrawn, distracted, elective mute, or with mental illness; for behavioural attributes, there are specific data on those who are disruptive, aggressive, who assault physically, abuse or bully, or who are involved in sexual misconduct, but there are no specific data on those with Tourette’s syndrome; for geographic features, there are no specific data on those who are isolated, in rural locations, or who choose limited travel as an option; for attitudinal features, there are specific data on those with low levels of literacy, but there are no specific data on those who are dissatisfied, disenfranchised, or disengaged; and for opportunity features, there are no specific data available on those with limited physical access, low levels or widths of awareness, or low levels of responsiveness or timeliness.

Taking the above known data into account, the total at risk population of 5 to 19 year old young people is likely to be high. However, some main categories where there is no data to indicate levels of at risk issues likely to be associated with reduced educational inclusion are: those who are socially deprived, or marginalised; those who are shy, withdrawn, mentally ill or elective mute; those who choose to travel within limited areas; those who are dissatisfied or with low literacy levels; and those with low levels of awareness of opportunities or knowing about opportunities in time to respond. These categories could be significant in terms of numbers (and in terms of support needs to address at risk issues). It is salient to consider that from a support point of view, these features are well recognised as those that arise in situations where support workers mediate and seek to help those who are vulnerable. A question highlighted, therefore, is: do the data that are gathered currently provide the best means for support workers in schools and associated with schools to fulfill their needs? London and Gurantz [18] ask the same question of data availability across institutions and agencies in the US context. A related issue to consider in this context is that a person at risk is an individual; and while aggregated data provide indicators that can lead to directions or dimensions concerned with social policy at an overview level, data to support the individual are often much more specific to individual circumstances and their consequent needs (discussed through specific case study examples in Scotland by Finlay et al. [19]). Clearly the range of at risk factors relating to one individual might not be the same as those for another individual; mediators are likely to be best equipped if they have levels of fine detail.

Relationships between young people at risk (with one or more of the listed factors above constituent in their lives) and levels of educational attainment have been explored in a wide range of studies. Connections between low literacy and social disadvantage have been identified over the last 20 years (see, for example, Kalantzis, Cope, Noble and Poynting [20], Connell [21], Orr [22], and Olisa, Paterson and Wright [23]). Low literacy has been associated with a range of social problems, including unemployment and delinquency (Holden [24]), and the fact that children from socio-cultural minority groups are less likely to experience literacy success in mainstream or school-based contexts (Gutierrez [25], and Heath [26]). Low literacy has been considered a barrier to full participation in society in Canada for about 9 million people, and it has been recognised that strong literacy skills are ‘an essential building block for future learning and self-reliance’ (Maxwell and Teplova [27]), while ‘poor literacy skills lead to a lifetime of economic and social insecurity for individuals and their children’. In 2006, the ‘1970 British Cohort Study’ [23] tracked the life experiences of over 9,000 34 year-olds at that time and documented the outcomes for those with weak basic skills. They appeared to have been impoverished in their life chances, with low social and political participation, heightened mental health and personal relationships issues. In adulthood, men and women with the lowest levels of literacy tended to enter the workplace earlier and were more likely to be unemployed by the age of 23. For those in jobs, these were the least likely to be full-time, or to include training or opportunities for promotion. Key findings from a study of the relationship between school achievement and future outcomes (Lamb [28]) showed a strong relationship between literacy and numeracy skills and retention rates, and participation in further education; young people with weak numeracy and literacy skills were more likely to experience long-term unemployment and lower average earnings at the age of 19 years. A case study to explore the relationship between school, home and community group literacy practices and the implications for students’ school success (Cairney and Ruge [29]), however, reported that schools needed to be more cognisant of cultural and linguistic diversity to optimise students’ success, recommending a provision of funding for programmes that could support such practices and encourage community-based initiatives. Studies of literacy practices in Australian early childhood classrooms (Makin et al. [30], and Raban and Ure [31]) suggested that definitions of literacy used in early childhood education at that time tended to reflect narrow and traditional views, and that the multiple literacy practices associated with and across homes, communities, and early childhood settings (for example, literacies concerned with technology and popular culture, everyday functional uses of print, and uses of languages other than standard Australian English) were often undervalued. They found that this limited approach to early literacy could be a disadvantage to children from socio-cultural minority groups, including children who spoke languages other than English at home (Makin, Campbell and Jones Diaz [32]), indigenous children (Malin [33]), and children from poor socio-economic backgrounds (Freebody and Ludwig [34]). It is clear that many pathways lead to literacy learning. Recent conceptualisations of early literacy emphasise literacy as social practice. This embodies a view of literacy as a social construction. Families, communities, and cultural groups teach children what can be said, to whom and how, and
under what conditions (Makin et al. [30]). Social constructionists argue that language and literacy learning is embedded in social practices in culturally specific sites, rather than in universal stages of child development and growth (Makin et al. [30]). Emergent literacy emphasises children’s capabilities in literacy learning through active, child-initiated experiences in which functionality, meaning, and communication with print and texts are important (Teale and Sulzby [35]). For mediators concerned with supporting youth at risk, these conceptions are clearly important. Mediators are not only in a position to directly support some of these literacy and numeracy interactions, but they may well be in a position to identify stages and elements of literacy and numeracy practice of individual (including those that would be judged through mobile text interactions, and email interactions, for example), which would lie outside the traditional forms by which young people might be assessed, but would be of benefit to the young person if records of their literacy could be retained and even gathered through electronic means.

Educational interventions clearly need to be concerned with these issues and their implications. With the development of literacy being a clear key factor in supporting young people at risk, it is important also to recognise that access to those instruments that assess learning might well be based on traditional concepts of literacy. One report (Kendall, Johnson, Martin and Kinder [36]) has highlighted many barriers that exist that prevent or increase the difficulties surrounding vulnerable young people’s access to examinations, focusing on difficulties at a number of levels, such as policy, curriculum, education provider and factors associated with the young people themselves. The report demonstrated that, where vulnerable children had successfully participated within the examinations system, the key to their success lay in the flexible approaches adopted by support staff and schools and effective communication between providers. Appropriate curriculum choice for young people at risk was recognised as a key issue for those who provided curriculum interventions, often leading to alternative curriculum choices that were more socially, practically or creatively focused. In this respect, an interesting finding from a study exploring curriculum choices by Israeli school students (Gabay-Egozi, Shavit and Yaish [37]) was: “hedgers [those choosing a mix of hard and soft subjects] came disproportionately from less affluent and less educated families, had lower scholastic achievements, and were more concerned with class maintenance, than those who chose either pure hard subjects or pure soft subjects. The possibility to choose a mix of subjects is not anticipated by rational choice models of education” (p.460). The position of ‘hedgers’ described in this paper could well be concerned with wide uncertainty about subjects offered, rather than a concern about choice of hard versus soft subjects. Plank et al. [38] explored the impact of career and technology-based education (CTE) on dropout rates in schools and concluded that: “for students who are of the modal age or young for grade at the time of high school entry, some CTE, combined with core academic course taking, may decrease the risk of dropout - but only up to a point. A combination of approximately one CTE course for every two core academic courses is associated with the lowest risk of dropping out after other variables in our models are controlled. Being below this point (taking few or no CTE courses) or being above this point (concentrating on CTE to the exclusion of adequate academic preparation) implies an increased risk of dropping out” (p.360). Cruz et al. [39] also emphasised the need for curriculum to provide a width of possibilities, rather than narrowing curriculum within ‘tracks’. They reported that: “tracking has been defined as the separation of students into different curricular paths by appointment or self-selection” (p.197), but that “instead of just focusing on specific skills for concrete occupations, their curriculum includes academic subjects for higher qualification, together with workplace-related skills” and “these vocational training programmes include mechanisms that allow students to move to the academic track; these measures can make the system more flexible and equitable, eliminating the walls that previously kept socially excluded youth from returning to academic education” (pp.204-205). For mediators, therefore, key features of forms of assessment and forms of curriculum need to be areas about which they are informed, and about which they can inform. Two examples of projects that have sought to enable mediators and young people to use digital technologies to support these aspects have been the development of multimedia curriculum vitae (see Passey, Davies and Rogers [40]), and the ongoing collation of evidence that will form a portfolio of exemplar work and achievements (called Virtual Ruksack in the Citizens Online and National Centre for Social Research report [41]).

Overall, to support the vulnerable through interventions, three clear areas of need are recognised and highlighted in the literature reviewed: the cognitive (concerned with developing literacy often, not just written, but also speaking and listening skills, and within the contexts of young people’s practice and culture, but also the development of numeracy, appropriate assessment of cognitive abilities, and knowledge of curriculum balance and opportunities); the emotional (concerned with understanding and assessing the value of the individual and developing aspects of self-esteem and personal identity); and the social (concerned with identifying and developing abilities to handle situations and interactions between individuals). There are clear needs for young people at risk to: develop dialogic interaction, discursive interaction and ‘internal’ discussion. Many young people may also engage with creative pursuits (see Passey, Williams and Rogers [5], for example). In these respects, does the standard data provision that is accessible to key stakeholders help them, or help the young people themselves? In England, the data that are accessible (but often only within certain institutions and not easily accessible to those in other groups) are prior national attainment or non-statutory test results, estimated future results based on previous performance, subject attainment targets, teacher subject attainment assessments, and added value indicators. These are all measures focused on subject content, rather than pedagogic or learning process (although some of these data might allow teachers to pick up on low levels of writing, pointing to or suggesting support through appropriate uses of a technology such as a virtual learning environment).
Indicators of attendance, effort, or behaviour from a school might highlight when contextual factors are arising, but do not offer any direct indication of potential actions in terms of pedagogic or learning process (although indicators of low homework completion might suggest to a teacher that this issue could be supported through appropriate uses of technologies).

Young people who are NEET commonly exhibit limited capabilities to support decision-making (Passey, Williams and Rogers [5]). These limited capabilities vary from individual to individual, and may arise because of a lack of: background experiences; decision making strategies at their disposal; skills in certain areas; abilities to make decisions; abilities to take decisions; or a refraining from decision-taking. In addition to this limited capability (in terms of decision making), other factors such as traumatic backgrounds and poor experiences of learning environments can mean that young people who are NEET often do not sustain employment or educational opportunities when these are offered to them. The importance of education in supporting decision-making processes was highlighted by Wheeler [42] who studied the relationship of education to sexual and drug use decision-making, concluding that: “Self-esteem was not a significant predictor of sexual debut among boys or girls in this study, although higher self-esteem at baseline lowered odds of substance use among girls 1 year later” (p.587), and “In this study, among girls, higher academic performance and to an extent higher self-esteem were protective against risky behaviors” (p.588), although “Among young boys, self-esteem and academic performance were not significantly predictive of illegal substance use” (p.582).

Young people who are NEET can sometimes engage more readily in practical and creative endeavour, and often desire involvement in social environments. In looking at a construction project to support homeless young people in Canada, Bridgman [43] noted issues that concern these forms of decision making, concluding that (p.791): “Staff at Eva's Phoenix are caught trying to mediate between their organizational aims of recognizing and cultivating the sense of agency of young people, on the one hand, and the more starkly hierarchical occupational cultures of their partners in industry, on the other hand. How can we encourage the exercise of agency by marginalized youth while at the same time train them to accept serious limitations on that agency in their future employment?”

In their recent report for a government agency in England, Passey and Davies [2] found that technologies are used in a range of ways by those who support young people up to 20 years of age who are not in education or training; but different uses occur to varying extents in different locations. Overall, technologies are used to: collect, store and manage data about young people who are not in education or training; collect and report opportunities and vacancies that exist; match interests and choices of young people with opportunities that arise in terms of jobs, vacancies, apprenticeships and work-based learning; create and maintain records of achievement, abilities and needs of young people who are not in education or training; communicate with the young people; and engage young people in specific endeavours or activities. Across different locations (there are at least 150 local authorities (LAs) in this one country), all support services use a database to store client records, but different support services use different database systems. The numbers of different systems in use is not known, and the variation in functionality across systems is not known. However, database functionality enables support service managers to monitor changes in the population of young people and to identify the key characteristics of this group. To facilitate the efficiency of this process (and to enable support for those who are highly mobile, within and between countries), electronic transfer of data clearly needs to be developed for many support services. There are examples of such data transfers that are reported, although details of the transfer processes and capacities are not detailed in the report about the YorOK data base and the Pan London CCIS initiative from the Citizens Online and National Centre for Social Research [41].

At this time, data systems have not been developed that have focused on the needs of support workers specifically, but nonetheless many support workers find that certain details to which they have access are of value to them (while others are not). Similarly, integrated systems have not been developed that have linked the strengths of data base records with the strengths of communication features. Across Europe, there have been a number of projects and developments that have involved uses of social interactions between mediators and young people, but to date these have involved uses of existing social media applications such as Facebook, or walled-garden community platforms such as Ning (for example, see Passey, Davies and Rogers [40]). But, as Engelen, Dekelver and Van den Bosch [44] report from their view of such projects and uses across a number of countries in Europe (p.15): “these tools are interesting and often widely adopted, but were built with other goals in mind than supporting the interactions between intermediaries and their target groups. Hence the range of strategies that intermediaries can translate onto these media often remains limited to offering information and basic forms of social interactions.”

The report from Passey and Davies [2] indicates that there are debates within careers services about how best to support young people who are NEET and the value of using technologies as opposed to personal contact. It has been found that support programmes often consist of two elements – communication, and engagement. Communication involves obtaining information about clients and also making them aware of opportunities. Engagement is to do with enabling the client to do something positive with the information and support with which they are provided. Many personal advisers in careers services see the potential for using technologies for communication purposes, while fewer see how it can be used to encourage engagement. One example of the latter is a project where young people were developing a series of television programmes to be made available through a website. From a management information perspective this highlights the implications that arise as support workers see the need to know how to communicate with and engage young people, while managers are concerned with outcomes and reporting progress, and policy makers in
government are concerned with targets or statistics for planning purposes (the percentage of young people in each LA area between the ages of 16 to 18 who are NEET is a key statistic used by the government to monitor and analyse the local youth labour market, levels of guidance and support needs, and the performance of the local careers and other agencies). A key question to ask is whether current management information systems cover the breadth of purposes of all stakeholders, and if not, how this development can most effectively be taken forward.

Whatever development approaches are taken (and there are arguments that a support worker perspective is the most important to begin the process), there are certain approaches that will need to be considered that take uses beyond the current stage. In terms of school-based management information systems, schools using data management effectively (reported in DfES [45] (p.3)), “prioritise the opportunity for teachers to discuss teaching strategies and encourage them to widen the range of their pedagogic expertise”. The need to enable management information systems to become tools that encourage and enable discussion, rather than information sharing, is a point made also in a review of school systems by Kirkup et al. [46]. The inability of systems to support such discussion could well be at the heart of their current limited use. Findings from a research study into uses of online guidance systems by careers advisors in England, for example, showed that: “current levels of engagement with ICT for the delivery of services to young people are low and (with some notable exceptions) that neither practitioners nor their managers regard this as a pressing developmental need for the immediate future” [1] (p.6).

4. Evidence from recent studies

The concept of using a technological system to support needs of youth at risk is not new; Brown et al. [47] described the developmental requirements of a data tracking system, defining tracking as “the ability to follow the service utilization or pathways of children and youth within a particular community, across agencies and programs, over time” (p.225). They went on to describe how it was possible to extract data from the system so that multiple service users could be identified, and patterns of use could be explored. They recognised the need to consider mediators being involved in different agencies, and the importance of relationship and roles being understood and agreed. In the Passey and Davies study [2], while the provision of support for young people depended upon particular individual circumstances of each young person, from an organisational perspective the support provision often involved a number of agencies and groups, with different and specific remits. In one LA, for example, careers support workers were the primary contact for young people who were NEET, but primary contact could for some young people be through targeted youth support key workers, the youth offending team, the teenage pregnancy team, learning disabilities transition mentors, substance misuse teams, or care leaver teams. In other LAs, contact for young people could also be through adolescent resource teams, the educational welfare service, schools, further education colleges, extended schools, education business partnerships, the primary health care trust, job centres, adult learning teams, safer and stronger communities teams, third sector housing groups, voluntary sector groups, and advice services. From a technology perspective, this width of contact groups and agencies offers both particular challenges and opportunities (which will be returned to later).

For reporting local records for national policy needs, careers services in England use particular categories of information, which have been provided from the government education department (reported in Passey, Williams and Rogers [5]). Experience in one city careers service demonstrated that placing information about young people within these categories was not always easy or consistent, especially as individuals needed to be placed in only one of the full range of categories provided. The category of ‘unemployed’ could be perceived as being very wide, for example, since individuals in this group could be registered as unemployed with either the careers service or the local job centres, while other young people were grouped in categories of ‘illness’ (which was used in this city to mean short-term illness), ‘unavailable on religious grounds’ (with no-one in this category in the city), ‘not economically active’ (which was used for long-term illness over 12 months or for disability), ‘unavailable for other reasons’ (which was used when it was not clear that any other category was appropriate), ‘young carer’ (which was used for those caring for relatives), ‘young parents’ (who were at home to look after young children), ‘pregnant’ (self-explanatory), and ‘personal development opportunity’ (which covered those involved in voluntary work that was both paid and unpaid). What is clear is that these categories might be used in different ways by different careers services, and that these forms of data might support policy needs, but would not be of great benefit to those mediators trying to resolve issues or provide learning opportunities.

For more local management information, a data base system in LAs is used to provide careers advisors with ranges of information displayed on different pages. In the system used in one city (reported in Passey and Davies [2]), there are 11 standard pages currently available:

- **Summary** - shows schools attended, interventions (all contacts with careers mediators are recorded but interactions with other mediators are not), an event history (activities the young person has completed) and last event notes (with detailed and dated notes). The summary does not, however, show groupings of interventions (such as behaviour or attendance or email discussion) or forms of event (such as those that are practical or social).
- **Destination** - shows the name of the institution where the young person is training or working, the type (from a
drop-down menu, such as school, or college), status (whether on work experience, or did not start, for example), position (for example, a plumber or joiner), notes (for example, indicating attendance is one day a week, whether it is full-time, part-time, hours worked, or working for a particular person), previous positions, and a history is given to show what people have done and for how long. What is not shown, however, is any pattern associated with these data, or what the time gaps between destinations might be.

- Events - shows detailed and dated notes that careers advisors enter, with types of interaction that occur, whether information has been sent, where individuals were seen, and what actions were suggested or taken. Again, no summary is provided to show patterns, or types of events that are prominent.

- Multimedia - allows action plans to be saved as MS Word files, or as PDF files.

- Code - shows aspiration codes (intended future destinations that the young person selects from their own interests). It can show general levels of qualification or projected levels (but these are not necessarily sourced from other places), and shows experiences of young people in the form of codes, again without summaries.

- Qualifications - shows schools or institutions attended, levels of subject examinations, predicted grades, achieved levels or grades, and dates. Although the LA provides these data, they are not transferred automatically. This limits its use, and there is no structure provided for careers advisors to record their assessments of literacy or communication skills, for example.

- General - shows the name, national record numbers, address, telephone, fax and mobile contacts, date of birth, ethnicity, gender, and the person involved in supporting the young person. Details are not derived or linked to measures of socio-economic deprivation of the living area, or remoteness or rurality, for example.

- Client - shows language at home, school leaving date, whether the young person is claiming national benefit, previous contacts, and whether they are available for employment.

- Additional - shows any disabilities, special educational needs, behavioural problems, youth offence records, other organisations involved in support, and individual circumstances.

- Action, performance, implementation, and review - provides an assessment based on an action, performance, implementation, and review form giving ideas about the young person’s self image, in terms of self-presentation, or their home, for example.

- Address - indicates current and past addresses and type of home, whether the home is a parent’s home, their own home, or a holiday home. In common with other pages, interpretation of these data lies entirely with the individual mediator; the system does not provide any intelligent alert or support notes.

Data is at the heart of the main management systems that support and record actions and outcomes for these careers workers and related services. Those data may come from systems that already hold details of certain types (such as previous qualifications, or contact details), but much of the detail of value to those who have primary contact with young people who are at risk needs to provide up-to-date information about the circumstances, challenges, attitudes and interests of the specific individuals. This means that those who have contact with young people need to be in the position of entering and providing those details, not only for their own records, but also for access by others. However, it is clear that individual support workers in LAs are in different positions in this respect. Reports from just six LAs in an online questionnaire indicated that: data about a young person is not logged and recorded in one case; data is put in manually in four cases; and data is transferred electronically when there are discussions in one case. There are clearly implications; important data needs to be entered, but there is a requirement on individuals both in time terms and in terms of technological access, and the greatest efficiency is only likely to be gained if electronic transfer is developed further in many of those LAs.

But, intelligent outcomes are not provided routinely by management information systems; intelligence relies entirely on individual mediator interpretation. Yet there are many background details that could be placed into the background of a system to make them more intelligent. Rusby, Taylor and Foster [48] studied the predictive potential of behavioural issues arising in kindergarten groups to school discipline referrals in the first grade of school. They concluded, importantly, that: “Presentation of problem behavior in kindergarten appears to be more salient than family income in predicting the prevalence of problem behavior at school in first grade” (p.346), Similarly, Bor, McGee and Fagan [49] found from a study relating behaviours at 5 years of age to those at 14 years of age that: “The strongest predictors are aggression and attention problems/restlessness more than double the likelihood of later antisocial behaviour” (p.370). Predictors are being identified and used by some team worker groups, such as those concerned with criminal activity, where risk factors to identify likelihood of recidivism or re-offence could also be linked to other systems. Rennie and Dolan [50] explored predictive value of UK systems already in use in this respect, and concluded that: “this study confirmed a significant relationship between time to re-offence and [factors in the young person’s risk and need summary]” (p.421). In the area of substance use and abuse, Hallfors et al. [51] from their study of predictive indicators of substance use concluded that: “Truancy is recommended as an essential variable for all student surveys. Not only is truancy highly predictive of substance use, it can be checked against school records to assess whether students at high risk for drug abuse are represented consistently in the survey sample” (p.210). Arteaga et al. [52] studied predictors of adult substance use and abuse, and concluded that: “substance abuse is primarily determined by individual (trouble-
making behavior and personal substance use experience), family (child protection services, parent expectations, and parent substance abuse), and school-related (mobility, deviant peer affiliations) measured up to the middle of adolescence” (p.1115), and “early family adversity (i.e., child protection services and family conflict) had a key role in predicting the onset of substance use and substance dependency”, but that “being female and having greater social maturity decreased the likelihood of progression to substance dependence. School factors in adolescence such as school mobility and school dropout also decreased the likelihood of progression to substance dependency”. Habib et al. [53] looked at predictors of alcohol use, and concluded that: “Family management, as the most significant predictor across all three measures of alcohol use, suggests that it may be an important aspect to consider in terms of community intervention programmes” and “In addition, the quality of the emotional relationship between fathers and adolescents, irrespective of their gender and age, requires similar consideration” (p.1756). In the area of child abuse, Brown et al. [54] studied predictive factors, and concluded that: “Low maternal involvement, early separation from mother, and perinatal problems put the child at risk for physical abuse, whereas poverty and large family size were strongly associated with child neglect, and daughters rather than sons, handicapped children, children with a deceased parent, and children living with a stepfather were at risk for sexual abuse” (p.1073), “maternal sociopathy and maternal youth were associated with risk for physical abuse, sexual abuse, and neglect”, and that “Other factors associated with risk for more than one type of abuse included early separation from mother, low maternal education, low paternal involvement, low paternal warmth, maternal dissatisfaction with the child, maternal external locus of control, poor marital quality, serious maternal illness, single parent, and welfare dependency, all of which were associated with risk for both physical abuse and neglect”. Importantly, they also concluded that: “as the number of risk factors increased, the likelihood of child abuse and neglect increased dramatically” and that “official records and youth self-reports of child maltreatment did not correspond in most cases when maltreatment was reported through one of the two data sources suggests that future research on child abuse and neglect should obtain data from both official records and youth self-reports” (p.1074). Do data systems currently allow such predictors that are educationally related to be recorded, and for these to be accessed at appropriate later times, perhaps in different institutions? London and Gurantz [18] call for an integration of systems allowing long-term views of student progress, and indicate the range of data that already exists in different institutions, but without links allowing progressive data to be viewed. As they argue: “To improve the secondary to postsecondary trajectories for at-risk students, it is critically important to be able to follow them through their educational careers and identify key junctures where intervention may be necessary” (p.197). A commercial system in the UK “Profiling [young people not in education, employment or training] and identifying those in need of early intervention, reducing long-term costs” (p.8) is currently available to LAs (Capita Children’s Services [55]), but it is not clear that this system offers identification of risk at ages younger than 14 years.

5. Limitations and future focus

It is clear that management information systems to support mediators of youth at risk are in early stages of development. Limitations exist at all levels across the system of stakeholders. Developments that accommodate the mediator need to be a focus for the future, but we need to consider the strengths and features of systems we have in place already. The 2009 EU Youth Report [56] was a pioneering effort to compile data and statistics in order to give a picture of the situation of young people in Europe. Being the first such report, it was clear that while the statistics offered within that report provided useful background pictures and perspectives, it would have been impossible for such a report to provide sufficient detail about: the very wide variety of groups that constitute youth at this moment; the wide variety of support groups and mediators who offer directions towards employment and participation within wider society for those different individuals; and the wide variety of different stakeholders who support the future of youth through policy and practice. To meet these latter needs, the provision of pertinent data is clearly important: such data will allow views of the current situation to be recognised, features for planning to be identified and considered, help to identify strengths and weaknesses, help to identify aspects for support, and help with planning by giving ideas of extents of support and qualities of interventions required.

The potential benefits that can be gained from having access to data on young people at risk at different levels is clearly recognised; there are some levels of data already available, that allow useful perspectives to be gained, such as those provided by Eurobarometer (2003) Youth in New Europe [57] and Eurostat. From these data, it is clear that while many young people do engage in education and training, and many do go on to become employed and to participate in society, there are young people who do not (both in the short, and in the long term). To support those who are at risk of disengagement from learning or employment, or those who are at risk of social exclusion, in practice and policy terms, data gathered from specific interventions could provide valuable details about more specific groups of young people at risk than has been possible previously.

Knowing more about the ways that youth at risk can be identified, and how constituent groups within the wider youth at risk populations can be positively supported, has clear potential. The EC Joint Research Centre Institute for Prospective Technological Studies (IPTS) has fairly recently begun to explore landmark areas in this domain; there have to date been a limited number of reports completed on specific groups of youth at risk - immigrants and ethnic minorities [58], for example. Influences and impacts of interventions on other youth at risk groups, through ICT-
supported initiatives such as WAI not, Voices beyond words (supporting the mentally disabled) or Replay (supporting young offenders), listed in Haché and Cullen [8] have not yet been identified. Data on a wide range of groups of youth at risk are just not available currently, and certainly not in forms that allow levels of comparison across EU Member States. Not only are there many groups of youth at risk where no specific data are accessible, but also detail from the data is fundamentally missing. Data are difficult to gather from some groups, especially when those groups are ‘hard to reach’. Even though sampling data can be useful (and some levels of this form of data are being captured through an IPTS project [59]), this evidence poses both methodological and interpretative challenges. Data accessibility and data requirements are clearly key developmental concerns: there is need for access to more social and emotional data, wider forms of cognitive data, features that allow a check that perception of support workers and youth are the same, a useful transfer of data and its uses, appropriate presentation of data and its uses. Coupled with this, there is a need to consider issues of reliability, validity and generalisability of data (see Sutherland [60], for example), as well as ethical and access issues. These forms of evidence, about ways to interact, and potential outcomes, need to become important parts of an intelligent management information system. Management information systems can move in development terms from being repositories of data, to intelligent systems that, for example, highlight potential ways for mediators to work, based on alerts through the reading of background factors. Similarly, there is a need for more detail about the qualities of support provided by social networking sites, the extents of interactions and their outcomes, and trends associated with youth at risk over time, for informing at better levels both practitioners and policy makers.

Moving forward in developmental terms will pose many issues and challenges. Van der Hof and Keymolen [61], for example, reporting on the movement in the Netherlands to aggregate data sources to track children and those at risk, state that: “extensive monitoring of children well into adulthood is paramount to be able to determine how they will (potentially) develop themselves – physically, socially and emotionally – and what risks they may (potentially) pose to others or society or run themselves” (p.320). They raise issues that clearly need to be considered within this field: “First, new technologies are deemed to transform the relationship between children and professionals in terms of a perceived lack of several features: trust, organisational and system transparency, individuality of patients, and autonomy of professionals. Second, the aforementioned developments with respect to the ECR [Electronic Child Record] seem to spread largely unchecked by specific legal safeguards and are prone to function creep. Third, children and their social environment become increasingly transparent to the government, whereas public administrative processes become more and more opaque to citizens, a trend which we have labelled: invisible visibility. Fourth, there are trends toward a growing personal data-intensity, an increasing abstraction of identities from the real person (“identity turned to stone”), and the deployment of stigmatising identities, all of which may impact the lives of children well into adulthood” (p.321).

But young people themselves may not see tracking as necessarily unwelcome.Wiehe et al. [62] used global positioning system (GPS)-enabled mobile telephones to track locations of young people. They reported that: “several of the adolescents’ peers felt threatened by the GPS tracking on the phone. During their exit interviews, 3 adolescents offered discussion about how their friends would not allow them to make calls from the phone because they thought they would be recorded or their activities would be reported to the police” (p.5) but “with due attention to privacy and confidentiality issues, this method is acceptable to teens and can be successfully employed without evidence of compromise to privacy or confidentiality” (pp.6–7).

6. Conclusions and next steps

This chapter provides a current positional perspective, and argues for future directions and requirements that consider: who are the vulnerable or at risk and how they might be categorised; what the needs of the at risk groups are; how technologies are involved in supporting or addressing these needs; how those who support the vulnerable use technologies; how support mediators use data; the ways in which those data are used; data accessibility and presentation; issues that need to be considered when reporting data and when viewing data; and features required for moving forward in this field, to support policy and practice.

Data about specific groups and about trends are not always easy to capture; it is necessary to consider using ICT techniques that can support, automate and enhance data capture (coupled with discussions with those for whom these data can have real purpose). Some longitudinal studies that have been undertaken do provide us with perspectives that are important. For example, Kelder, Perry, Klepp and Lytle [63] studied smoking, physical activity and food choice behaviours of 2,376 students over a seven year period. From annual self-reports, the authors concluded that: “once students become weekly smokers, they are unlikely to give up cigarettes” (p.1124) but that for physical activity and food choice “students are indeed changing their behaviors over time but that the change is relative to the behavior of their peers” (p.1125). So, there are important questions to be considered here, about long-term patterns of features of being at risk, and ways that influence longer-term engagement in education, training or employment.

It is clear from research evidence that the roles of education are important in terms of supporting youth at risk in the future – factors concerned with putting young people at risk are often outside the boundaries of the schools themselves initially, they are not necessarily known in schools, yet early interventions cannot be put into place easily without knowing them, and school dropout often results as a form of school disengagement when interventions are not put in
place (lack of attention or lack of attendance). The important roles of education in terms of supporting short-term and longer-term needs are being recognised and identified. Thomas et al. [4] identified key protective factors for youth at risk. When these are viewed, the role of education is clearly fundamentally important: “The protective factors are: Strong bonds with family, friends and teachers; Healthy standards set by parent, teachers and community leaders; Opportunities for involvement in families, school and community; Social and learning skills to enable participation; Recognition and praise for positive behaviour” (p.19). But it appears currently that mediators are often getting too little detail too late. Cunningham et al. [3] conclude that: “A youth portfolio that includes policies and programs only for those ages 12 to 24 is starting too late. Preferences and behavior are formed from a very early age, so programs to prevent risky behavior need to start at a very early age. The focus should not only be on children, but also on their families, schools, and the other environments that shape their young minds” (p.14). But, developing an integrated system that will support early interventions may not be an easy task in itself. As Van der Hof and Keymolen [61] report from developmental work in the Netherlands seeking to take this approach: “An extensive use of the ECR by third parties can harm the necessary trust between children, parents, and professionals. The Dutch Association for Youth Healthcare Physicians has expressed its concern about a lack of trust of children and parents that may result in their avoidance of care” (p.316).

There are financial, educational and social arguments that data management systems should be developed further to positively support early interventions for youth at risk. Cunningham et al. [3] state that: “Demographic trends in LAC suggest that the total costs of risky behavior by young people will increase in the future” (p.6). Van der Hof and Keymolen [61] argue that such systems offer educational and social value, and as Passey and Davies [2] state, whether LAs support the deployment and uses of technology by careers advisors (mobiles to maintain contact with young people, to support those in more remote areas or to provide information that is timely, or laptops to help test or assess skills or capabilities, to help with creating curriculum vitae and application letters, or to track life skills, to maintain portfolios of work, or to show examples of what others have done), in centres, or in public areas, could make a fundamental difference to access and use. Similarly, the ways that technology is used to make job vacancies accessible, or courses and apprenticeships accessible or to indicate the relative numbers of jobs and courses needed to match numbers of young people who are NEET, could make significant differences to availability.

If we are to move towards a situation where such advantages can be gained, then we need to: analyse the needs of each stakeholder group (particularly mediators and young people themselves); consider how the discussion-making side is supported; look at how to record and monitor different types of data – social and emotional as well as cognitive, and from earlier ages; consider the needs of a range of different users; integrate forms of interaction that will work for young people– social, as well as discursive; identify the ‘architectural’ needs of the system; build in appropriate forms of feedback – to heighten reliability and validity; consider the presentation of data for different audiences and purposes; consider the forms of presentation of material that might provide exemplars for mediators; integrate features that allow for a checking of perceptions – matching mediator and vulnerable perceptions of outcomes of a discussion; and build in exception reporting and alerts to support earlier interventions. Technologically, these requirements are feasible; at a societal level, it places us in a position to discuss a different, earlier, social approach to helping the vulnerable.

Acknowledgements The research study commissions of Becta, the UK government agency responsible for e-strategy, of exploratory studies in this field are gratefully acknowledged here. Key findings from those studies, not necessarily representing the views of that agency, are reported in this paper. Thanks are due to colleagues Paul Davies, Colin Rogers, and Sadie Williams, who contributed greatly to the reports of those commissions and the findings presented here.

References

[2] Passey D, Davies P. Technology to support young people 16 to 18 years of age who are not in employment, education or training (NEET): A Local Authority Landscape Review. Coventry: Becta; 2010.


[27] Lamb S. School achievement and initial education and labour market outcomes. Camberwell, Vic.: ACER; 1997.


