

## Enhancing the Performance of Human Resources through E-Mentoring: The Role Of an Adaptive Hypermedia System Called “AVEUGLE”

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**[Abstract]** Coaching and mentoring have many commonalities but can also be seen to be different. The aim of coaching is to help people transform being where they are to where they want to go, which may be on a path that has not yet been trodden. Mentoring is a one-to-one communication between a mentor who has “been there and done that” and a mentee who wants to “learn the ropes.” This paper looks at how these practices can be enabled online through Virtual Coaches and the extent and limitations of the GROW model for online coaching and mentoring. It finds that the GROW model is limited in what it can do, and that it needs to be extended to consider factors beyond goals, realities, options, and wills. It is suggested that “engage” and “routinize” be added to create a new model called “GROWER.” An extension of the M-MARS model making it M-REAMS (i.e. Methods, Rules, Enmities, Amities, Memes, Strategies) is proposed for an ethnomethodological approach to reflective learning. The paper concludes that virtual coaches can provide benefits in terms of enhanced mentoring and coaching relationships.

**[Keywords]** Human resources; e-mentoring; adaptive hypermedia; AVEUGLE; ethnomethodological approach; virtual coaching;

### Introduction

Defining coaching and mentoring in terms of their *différance* (Derrida, 2001) is difficult (i.e. what the difference between the two words is). Coaching and mentoring are both forms of learning conversations, which require reflection during and after learning conversations (Maritz & Roets, 2013). Even more difficult is defining coaching and mentoring in terms of the *différance* (Derrida, 2001) of the words (i.e. what words are used to explain the meaning of both words and how they are different). Some have proposed that the *différences* between coaching and mentoring are that while both are similar interventions, they can be differentiated primarily by the extent to which they are described as being directive or non-directive (van Nieuwerburgh & Tong, 2013). These, however, may not be seen as satisfactory expressions of the *différance* and difference of coaching and mentoring. Both the activities, coaching and mentoring, can be led by either the coach or coachee. A more appropriate *différance* might be that mentoring is done by those who have been there and done that and want to show someone else the ropes, whereas the aim of coaching is to help a person transform being where they are to where they want to go, which may be on a path that has not yet been trodden. The *différance* would, therefore, relate to the role of the coach or mentor – whether it is to share his or her experience in the case of mentoring or help the participant realize his or her potential in the case of coaching.

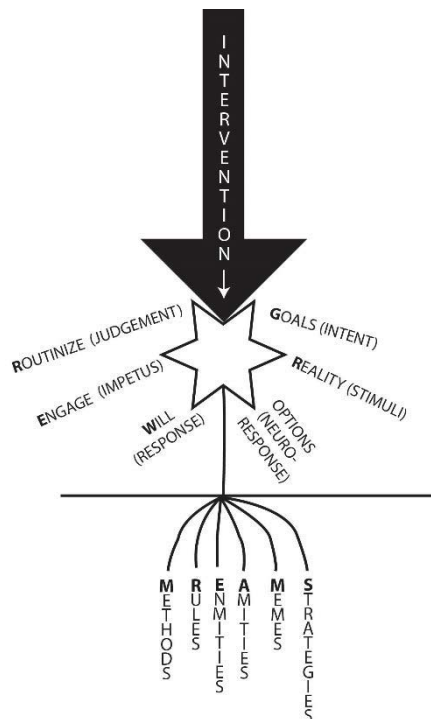
### *Traditional Approaches to Mentoring*

There are a number of established approaches to coaching and mentoring, each often with its associated acronyms, such as GROW, CARE, ERR, and OSCAR. The GROW model, which stands for “goal,” “reality,” “options,” and “will,” is generally accepted to be the standard method for coaching and mentoring and the teaching of it (Martinez, 2014). In summary, it reinforces a positive sense of identity by mapping people's wishes according to their goals, their reality, their options, and their wills (Dixon, 2011). The CARE model, which stands for “creating” comfort, raising “awareness,” “reawakening” the flow of learning, and “empowerment,” is designed around a framework with a two-fold purpose. This is to provide a guidebook of techniques and behaviors to encourage learning and to ensure beliefs and values that underpin the model is put into practice (Turnbull, 2009).

The ERR model, which stands for "emotion, reality, and responsibility" is intended to acknowledge one's "emotions" and stay with them, explore the "reality" of the situation and separate facts from assumptions, as well as to be coached to get ownership and "responsibility" for actions and decisions (Arnold, 2014). The OSCAR model, which stands for "outcome, situation, choices, actions, and review," builds on the GROW model with outcome reflecting goals, situation reflecting reality, choices and consequences reflecting options and action and review reflecting will (Rogers, Whittleworth, & Gilbert, 2012).

### ***The GROWER Model for E-Mentoring***

Figure 1 shows the GROWER, which adds "engage" and "routinize" to the GROW model, of "goals," "reality," "options" and "will." There are things to be learned from the other models available for mentoring at present. In the case of the first, this refers to the need to understand what it is that motivates the mentee/coachee above all other things so that the coach/mentor can devise options that most fit with the person's outlook.



*Figure 1. The GROWER model*

The OSCAR model was proposed as an alternative to GROW, and indeed the "action" and "consequences" elements in the OSCAR model are similar to the "engage" and "routinize" elements in GROWER. The Empowerment component of the CARE model has been used in GROWER to enhance what is provided through GROW, yet goes beyond the CARE model by focusing on the development of skills and not just the realization of where one has been and where one wants to go. In addition Figure 1 suggests the "M-REAMS" approach, by extending the M-MARS approach (Bishop, 2011a) to include "enmities," based on the newly identified "bothered" cognitive bias. Enmities are people who inhibit one's goal. In the case of the participant in this study, that was his line-manager. The model, as a whole, can be useful for reflecting on a coaching session as an alternative to Gibb's model, which, along with the "GROWER" model, provides an integrated approach to reflecting mentoring/coaching. With online approaches, it is possible for participants to record the conversation and play it back to enable reflection. Thinking in terms of the "methods" (e.g. what approaches they use or want), their rules (what they feel they must do), their amities (who they feel is on their side), their memes (what they believe or want to believe) and their strategies (what they want to

achieve) can complement the original GROW model, as well as the proposed GROWER model.

### **Background**

There are a number of important considerations when considering whether coaching and mentoring can be effectively enabled in an online space. The purposes of coaching and mentoring need to be considered, including their different approaches and the impacts of the Internet on the practice.

#### ***The Purpose of Coaching and Mentoring***

Understanding the purpose of coaching and mentoring is, therefore, important. Within work, coaching, and mentoring is associated with improving the level of performance, bearing responsibilities, planning and carrying out duties, following up on steps for better results, self-actualization, and creativity (Bacon, 2003; Grine, 2014; McLean, Yang, Kuo, Tolbert, & Larkin, 2005; Phillips, 1994). Regular coaching and mentoring, is highly significant in shaping leadership proficiency but exerts less influence than real-time experience, providing testimony that formal and experiential learning form as an important part of leadership capability compatible with various different faiths (Stehlik, Short, & Piip, 2014). In terms of emerging and troubled economies, such as Afghanistan, coaching and mentoring is a core component of governance reform (Rosén, 2011).

It has been argued that working internationally can involve the use of a virtual coach who delivers training, coaching and mentoring online (Little, 2014), something that will be explored in the rest of this article. Concepts such as peer coaching have been shown to be effective in helping workers and teachers improve their techniques, such as questioning, without being evaluative (Skinner & Welch, 1996). It has been argued that introducing learning outcomes into coaching can improve its effectiveness for an individual, providing the process is clear (Brockbank, 2008; Stevens & Frazer, 2005). In some areas, peer coaching is seen as fundamental to professional development (Waddell & Dunn, 2005). In teaching, peer coaching often takes the form of educators giving a lesson and then having feedback and suggestions from their colleagues (Bowman & McCormick, 2000).

The model coach mentors choose to use depends on their own context, style, and approach (Deans & Oakley, 2007). Grounded in partnership and focused on practice, most coaching and mentoring models are dialogical, non-evaluative, confidential, and respectful (Spezzini, Austin, Abbott, & Littleton, 2009). Coaching and mentoring models can provide intensive, direct instruction in the conceptual and procedural foundations of effective classroom practices, as well as on-going support and individualized feedback (Wasik & Hindman, 2011).

#### ***Extent and Limitations of Coaching and Mentoring through Digital Technologies***

While in-person coaching is the most common method used, virtual coaching is becoming more prevalent (Ghods & Boyce, 2013). Some critics have gone so far as to say coaching is only truly effective when done in person (McCarthy, 2010). One might compare coaching and mentoring on the Internet as a form of online interviewing. Many people online prefer to observe and not to post because of problems feeling comfortable enough to participate, which might exist with a virtual coach (Bishop, 2007; James & Busher, 2009; Nonnecke & Preece, 2000). Online interviewing can, it is argued, allow individuals to develop their own order, goals, and interests (Bishop, 2007; James & Busher, 2009, p.47; Mantovani, 1996), which is perfectly appropriate for coaching and mentoring.

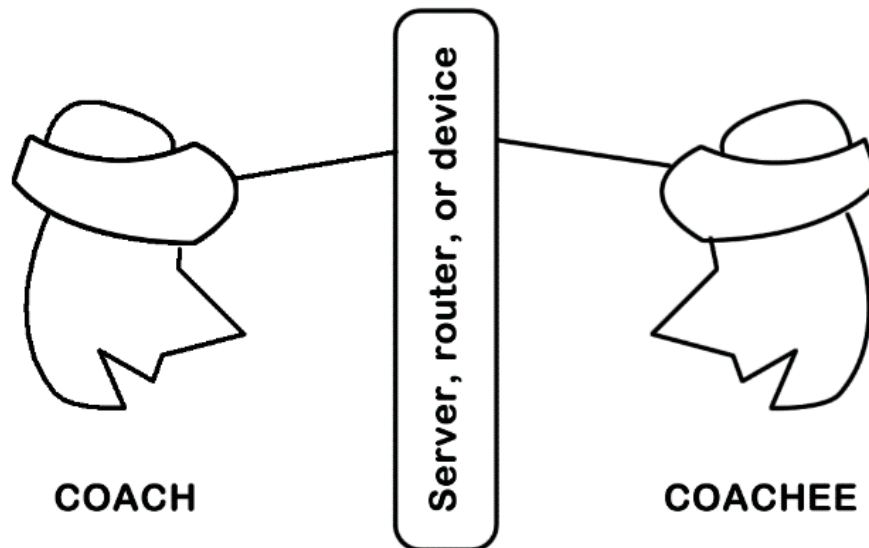
One-to-one coaching online may not have the problem of having to work through elders or other users (Bishop, 2007, p.91; James & Busher, 2009), and as many people have preferred ways of communicating online (Bishop, 2007; James & Busher, 2009, p.136), then virtual coaches may have to consider the preferred platform of communication for their coachee or mentee. This is known to be a factor in the effectiveness of virtual coaching, as selecting the most appropriate method of virtual coaching is the key to a successful relationship between coach and coachee (Mitra & Kalia, 2010).

Technology is known to be a core factor in ensuring effective virtual coaching in terms of its development and execution (Punyanunt-Carter & Hernandez, 2010). Virtual coaching, by using technology, can allow for the provision of feedback, such as to learners, which can shape the learning process and the awareness of each party's strengths and weaknesses (Rock, Zigmond, Gregg, & Gable, 2011). Indeed, it is possible for technology that is used for virtual coaching to be manufactured in order to encourage user acceptance (Leist &

Ferring, 2012). The economic and business case for virtual coaching is also important. With education budgets falling, virtual coaching can save both time and money (Allen, 2014). It is known to be very effective in ensuring the professional development of staff (Cantwell, 2007) and in improving business management skills in educational environments (Rock et al., 2009; Salter, 2015). Virtual coaching can help people with disabilities, such as social orientation impairments, especially those with special educational needs (SENs) (Gable, 2014). Virtual coaching can help people with SENs overcome problems, such as impairments in functional skills (Brandenburgh et al., 2014; Israel, Carnahan, Snyder, & Williamson, 2012). Professional communication expertise is always helpful in virtual coaching, especially where disabilities and other protected characteristics are accommodated (Clutterbuck, 2010).

### **AVEUGLE – The Audiovisual Enhanced UI for a GROWER Learning Experience**

This section presents a system called the Audiovisual Enhanced UI for a GROWER Learning Experience (AVEUGLE). AVEUGLE involves at least two people sending and receiving information who can either interact in person within an organic community or remotely through a virtual community. The key element of AVEUGLE is that it has sending and receiving users using some form of device that is interfaced with a bridge or facilitating human and through which a translator and artificially intelligent agents enhance the communication of the coach and coachee. This concept of AVEUGLE is represented in Figure 2, which is based on prototyping the author has done with ezVision and Google Glass video glasses.



*Figure 2. The AVEUGLE prosthetic learning environment for Virtual Coaching*

#### ***Sending/Receiving User/Device***

The sending and receiving component of AVEUGLE can include the one that a coachee is most familiar with or in the case of sessions in organic communities, it could be used by the virtual coach in person and could take the form of Google Glass or Microsoft HoloLens. The purpose of the technology would be to allow the virtual coach and coachee to send and receive information that is accessible to both, such as to overcome cultural or other differences that might make a relationship difficult. Figure 3 presents an example user interface that AVEUGLE could use to represent information (Bishop, 2009b).



Figure 3. A possible interface for AVEUGLE augmenting information with a live video input

### ***Facilitator/Bridge***

In most cases, the information from the sending and receiving devices will have to be parsed through some form of device, which can include the virtual coach's computer, or a cloud-based device, such as a server. Using a server can mean a lot of the processing power needed for AVEUGLE would be away from the client device and would improve the user experience. Ensuring the interoperability of bridges is known to affect the extent to which a technology functions and is used in domestic environments (Moon, Lee, Lee, & Son, 2005). It is known that with e-learning systems in particular that using bridges for interoperability is essential (Weichhart, 2015).

### ***Translator***

The translator component of the system receives information, processes it, and then provides a statement or recommendation (Bishop, 2003; Bishop, 2009a; Bishop, 2011b). As can be seen below, it involves working with language use and behavior detection, language translation, an intelligent agent and recommender system, and a fluid and dynamic text. Indeed, the first embodiment of AVEUGLE was called "PARLE 2", as it was intended to be a successor to the Portable Affect Recognition Learning Environment (Bishop, 2003).

**Natural language and sentiment analysis.** The system has been designed to be able to identify representations of social norms in virtual communities, which may be different from those in organic communities (Bishop, 2002). Understanding behavior and the use of language is known to be important in online learning environments designed to promote user interaction (Orkin & Roy, 2007). Understanding language use in online environments is important in helping avoid unwanted behaviors, such as flaming or trolling (Schultz, 2002).

Table 1. Example of features of behaviour for natural language processing and sentiment analysis

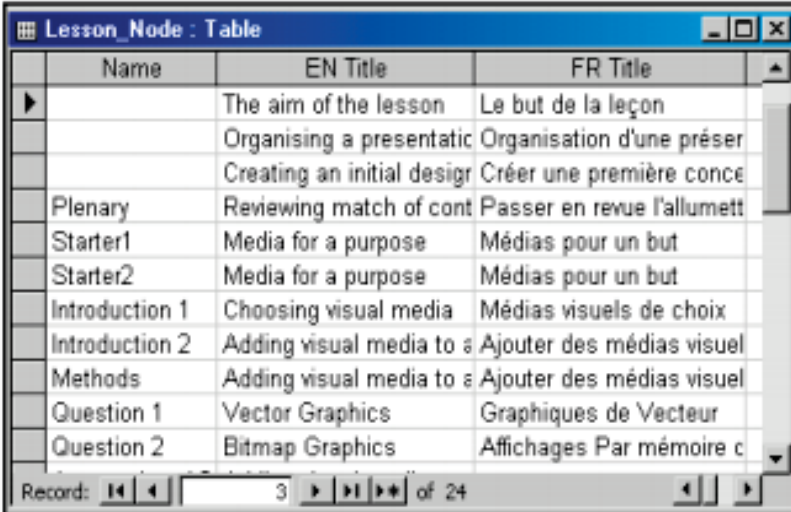
<b>Organic community want</b>	<b>Virtual Community want</b>
Give an empathic twenty minutes of unsolicited, quality attention each day.	Calculating the length of time two people chat for.
Bring an empathic flowers as a surprise as well as on special occasions.	Calculate number of virtual gifts sent.
Compliment an empathic on how they look.	Identify compliments in chat text.
Give an empathic four hugs a day.	The number of times a "send a hug" card is sent, posts liked, etc.
Tell an empathic: "I love you at least a couple of times every day."	Count the number of times a person says "I love you."
Take her side when she is upset with someone.	Difficult, although phrases such as "I believe you" could be searched for.
Display affection in public.	Check whether symbols of love are said in public chat room other than a private one.
Pay more attention to her than others in public.	Check that the number of chat messages to someone's partner is greater than to other community members.
Buy her little presents, like a small box of chocolates or perfume.	Calculate the number of greetings someone send their partner.
Write a note or make a sign on special occasions, such as anniversaries and birthdays.	Calculate the number of greetings sent or classifieds placed to someone's partner near their birthday or specified event.
Surprise her with a love note or poem.	Calculate the number of 'Love' greetings sent.
When listening to her, reassure her that you are interested by making little noises.	Check for words of agreement in chat text.
Ask her how she is feeling.	Check for phrases such as "how are you" in chat text.
If she has been sick in some way, ask for an update and ask how she is doing or feeling.	Check number of "Get Well Soon" greetings are sent.
Let her know that you missed her when you went away.	Calculate number of "I missed you" or "Welcome back" greetings.

As can be seen from Table 1, there are differences in language behavior online compared to offline (Bishop, 2002).

Table 2. Examples of language use and behaviour detection by Autistics

Organic community want	Virtual community want
He makes a mistake and she doesn't say "I told you so."	Check that chat text does not include "I told you so."
He disappoints her, and she doesn't punish him.	Check that chat text does not include certain negative words.
When she has hurt him, and she understand his hurt, she apologizes and gives him the love he needs.	Check for words of apology in chat text, such as "I'm Sorry." Calculate the number of "I'm Sorry" cards that are sent.
When he apologizes for a mistake, she receives it with loving acceptance and forgiveness.	Check for keywords in chat text, such as "That's okay."
She asks for his support rather than dwelling on what he has done wrong.	Check for keywords such as "can you" or "would you" in chat text.

**Language translation.** The device and/or bridge could detect cultural cues, as well as other information, in order provide a recommendation based on this (Bishop, 2009a). This can include updating a person's reputation value (i.e. kudos score) so people know they are likely to be treated more favorably (Bishop, 2002).



Name	EN Title	FR Title
	The aim of the lesson	Le but de la leçon
	Organising a presentatic	Organisation d'une préser
	Creating an initial desigr	Créer une première conce
Plenary	Reviewing match of cont	Passer en revue l'allumett
Starter1	Media for a purpose	Médias pour un but
Starter2	Media for a purpose	Médias pour un but
Introduction 1	Choosing visual media	Médias visuels de choix
Introduction 2	Adding visual media to a	Ajouter des médias visuel
Methods	Adding visual media to a	Ajouter des médias visuel
Question 1	Vector Graphics	Graphiques de Vecteur
Question 2	Bitmap Graphics	Affichages Par mémoire c

Figure 4. Cultural translations from AVEUGLE

The system could track what someone says in a discussion group, translate it according to its merits (i.e. whether it is positive or negative), and then display that translation through increasing or decreasing someone's reputation, affecting how others perceive them in the online space they are present within (Bishop, 2002). Language translation that takes account of cultural cues is known to be important in promoting equality and diversity (Hayes-Roth, Maldonado, & Moraes, 2002). Difficulties with translating language and cultural cues is known to be a problem assisting the integration of minorities into communities (Xu, Bekteshi, & Tran, 2010), so having this functionality in a virtual coaching environment is essential.

### *Intelligent Agent and Recommender System for Analysis And Segmentation of Users*

The intelligent agent and recommender system can be implanted through sending statements to the AIML file and the possible response back to the user. This can be used initiate culturally aware instructions.

Recommender systems have played a big part in e-commerce for decades (Schafer, Konstan, & Riedl, 1999), and there is no reason for them to not be introduced into education. Such systems can be introduced into the education system through animated pedagogical agents, which are virtual characters that augment the learning process (Lee, Kanakogi, & Hiraki, 2015).

**The role of animated pedagogical agents for assisting segmentation of users.** An example of how the animated pedagogical agent that the user could be facing in order to gather information is presented in Error! Reference source not found.. Furthermore, as the interests of secondary school learners are likely to change frequently (Tomlinson, 2014), educational material will always appear current and relevant if the learners are encouraged to update their profiles (Bishop, 2004).



Figure 5. An Intelligent Animated Pedagogical Agent for Use with AVEUGLE

Through the APA, educators have the option to embed parameters into learning material to personalize it with textual artefacts that have been defined by the individual learner. This is achieved through placing the parameter into a specific part of the text and surrounding it with parentheses. For example, if the learner's favorite actor is Tom Cruise, the text, "Write about a movie starring {User\_Char\_FavActor} that you enjoyed" would be converted into "Write about a movie starring Tom Cruise that you enjoyed," which should create a positive attitude towards the activity as it is about something the learner is interested in. Furthermore, as the interests of secondary school learners are likely to change frequently, educational material will always appear current and relevant if the learners are encouraged to update their profile.

**Adapting the user interface through dynamic and fluid text.** AVEUGLE adapts the user interface through the use of 'sets' of information and 'profiles' about each user's individual preferences. One use of such sets can be to generate dynamic text. Dynamic text, which involves the personalizing of an interface to the learner, has been used significantly in systems based around Adobe Flash (Sorapure, 2006). Educators have the option to embed parameters into learning material to personalize it with textual artefacts that have been defined by the individual learner. This is achieved through placing the parameter into a specific part of the text and surrounding it with parentheses (Bishop, 2004). For example, if the learner's favorite actor is Tom Cruise, the text, "Write about a movie starring {User\_Char\_FavActor} that you enjoyed" would be converted into "Write about a movie starring Tom Cruise that you enjoyed," which should create a positive attitude towards the activity as it is about something the learner is interested in. Table 3 shows how the system adapts the language depending on the ability of the learner using it.



Table 3. Adaptive Learning Levels in AVEUGLE

NC Level	Bloom Level	Personalization
1	1	Knowledge: Restructures content and rewords questions to encourage observation and recall of artefacts and subject matter.
2	1	As NC level 1
3	2	Comprehension: Restructures content and rewords questions to encourage learners to develop a social context of artefacts and understand their meaning.
4	2	As NC level 3
5	3	Application: Restructures content and rewords questions to encourage learners to apply knowledge to other social context and situations.
6	4	Analysis: Restructures content and rewords questions to encourage learners to make relationships between artifacts and recognize patterns and hidden meanings.
7	5	Synthesis: Restructures content and rewords questions to encourage learners to use artifacts in different contexts and situations and develop new concepts and ideas.
8	6	Evaluation: Restructures content and rewords questions to encourage learners to compare uses of artifacts and develop theories and select artifacts based on reasoned argument.

Figure 6 shows how AVEUGLE operates to make use of 'sets' and 'profiles' to adapt the user interface. For example, these could be used to provide additional information to users to make using the system much more suited to their ability levels or other differences (Bishop, 2004). In Web browsers, the "longdesc" attribute can be used to provide more detailed descriptions (Bishop, 2004; Bishop, 2012) so that by looking at the bottom of a browser, the users can see the purpose of the link they are hovering over. Using a prosthetic system like Google Glass, it would be possible for this to be implemented using menu selection and stroke input (Chan et al., 2013).

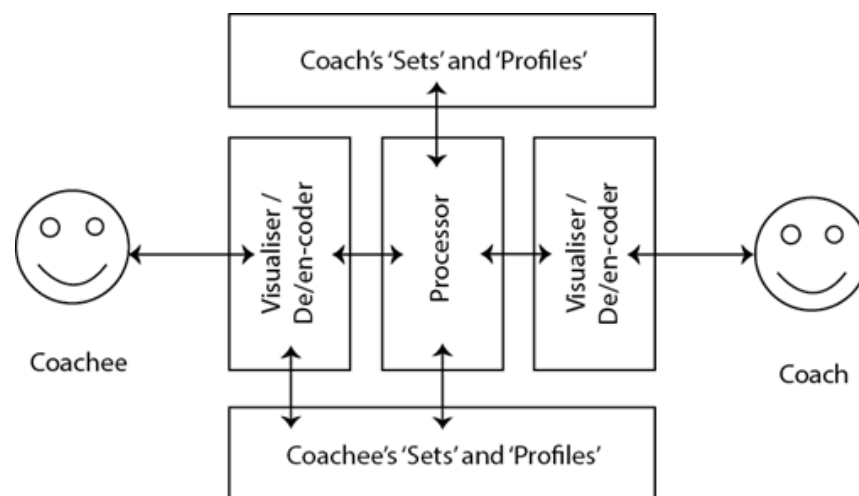


Figure 6. How AVEUGLE makes use of 'sets' and 'profiles' to adapt interfaces

## **An Investigation into The Potential of AVEUGLE for E-Mentoring to Assist the Personal Development of Workers**

In order to test the concept of AVEUGLE, an experiment was designed to allow for the evaluation of e-mentoring at a distance.

### ***Participant***

The participant in the study was not a genuine coachee or mentee, as this would have involved significant ethical considerations, but as the person was experienced in coaching and mentoring, he or she would be able to provide an authentic context for assessment. Ethical considerations that were implemented, however, included the right for the participant taking part in the study to exit if he or she wanted to, for which he or she would face no penalty. Online participation posed fewer problems in this regard, also.

### ***Methodology***

The session on Skype was recorded with the permission of the participant and then evaluated using the GROWER model (Bishop, 2015). This is applied both in terms of the researcher's thoughts and his or her reading of the participant's theory of mind. The participant was given the name "Terry," and it was taken that he was "referred" to coaching because although he was a "talented and innovative employee," he was beginning to feel "stuck in a rut" and was demotivated at work, and so he wanted to explore why that is and how to get 'back on track' again.

### ***Results***

The recording, when analyzed, suggested that focusing on the goals of the mentees could actually assist with the building of a rapport between them and the mentor/coach. It was clear to identify using the GROWER model that the person's difficulty was with their "options" and "will", as they felt a lot of the autonomy they once had that they lost, showing that by exploring goals the reality can be identified also. Using questions around 'options' appears quite key to understanding the situation, from which the "goals" and the way forward for the mentee/coachee can be identified and agreed upon, such as being part of an action plan.

Turning to the specific aspects of the session relating to the use of the online environment, it was clear that the aspects the GROWER relating to "engage" and "routinize" can be most effective in building on the emotion and evaluation elements that come out of e-mentoring. One might see from the records that the use of online conferencing, such as Skype, can actually break down many of the barriers to bonding and rapport. It was much more effective in terms of using a headset to pick up the different tones from the participant in order to judge how best to respond, such as framing the appropriate question. However it is easy to see how more traditional mentees/coachees might not warm to this in the same way, finding the loss of some affective information such as body language would reduce the trust building process rather than enhance it.

## **Discussion**

It is possible to conclude from this study that coaching and mentoring online can have lots of benefits for an organization in terms of allowing coaching and mentoring to take part in an environment that the mentee/coachee feels comfortable with. Although the study used a synchronous approach through Skype, it is argued that a full implementation of AVEUGLE could offer many more benefits.

The investigation in this article shows that the participant is motivated by autonomy and independence. A system like AVEUGLE provides that opportunity, as the option for sessions to be conducted at a distance can allow for the e-mentoring to occur around a mentee/coachee's life. It is usually a necessary part of a coaching/mentoring session for certain skills or practices to be developed for long-term benefit. By e-mentoring via AVEUGLE, it is possible for skills to be developed in context, such as in the workplace. Indeed, the participant in this study was seeking out opportunities where he or she could make use of his or her self-managing abilities.

It is quite clear that e-mentoring systems like AVEUGLE, which can provide both and online and in-person augmented reality, can allow for enhanced development of human resources in terms of learning for

organizational and personal change. There are many cultural differences between mentor and mentee, even if they exist in the same country. The adaptive interface of AVEUGLE can allow for emotional and cultural cues to be changed to provide context-specific interventions to break down barriers. Interface options like fluid text can assist provide information at the time it is needed and the dynamic text can take account of user requirements. Future research will need to test in more detail the effectiveness of these for encouraging rapport and sense of community among those mentors and mentees using AVEUGLE.

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