New Developments in the field of Didactics: Application for Enhancement of Excellence in Agriculture Education and Training

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The study was carried out in uMzingwane district of Matabeleland South province in Zimbabwe to identify practical strategies that can be used to enhance agricultural knowledge among agriculture scholars. The research applied both tacit and informal theories (Schraw and Moshman, 1995) to identify ideal approaches in adult learning aimed to create scope for researching on agriculture learning didactics. A multi-stage random sampling was used to select 65 agriculturists (farmers) to which structured questionnaires were randomly administered. The data was analysed using a Statistical Package for Social Science (SPSS, 2013). Farmers prefer learning through demonstrations (63%), participatory appraisals (17%) and question and answer (10%). There was an association in learning didactics using demonstration methods and word instruction: (χ²=11.673, P<0.05). There was also strong positive correlation (r=0.8) between knowledge application using field trials and open or field days. Role plays seemed to out of fashion (r=0.2). Training in agriculture should be holistic and emphasize on application of theory into practice. Some developments in the field of didactics are in harmony with training methods and approaches but they underscore the importance of matching training goals to individual, sector and national skills. There is need to rationalize and select cost effective teaching methods that consider institutional and national resource.

Key words: Agriculturist, farmer, didactic, demonstrations, training

INTRODUCTION

The importance of capacity building in agriculture is increasingly recognized by all the actors keen for sustainable development. Hess et al., (2013) and Helt (1996) argue that knowledge as ‘human capital’ has always been central to economic development. Limited capacity to adopt new developments in the field of didactics to enhance agricultural knowledge, skills and attitudes among aspiring agriculturists and farmers undermines effective execution of collective vision and goals of many developing countries in Africa (World bank, 2007). The greatest challenge to agricultural education and training in Zimbabwe is to equip agriculturists and farmers with tools to produce adequate food, surplus cash crops and livestock products for income and employment generation, exports for foreign currency earning (Mollar, 1998). Agriculture Education Skills and Improvement Framework (ASIF) (NEPAD, 2015) have been designed and applied to leverage the quantity and quality of skills needed to advance growth in agriculture.

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These initiatives have come in light with economic challenges, climate change, demographic pressures, food insecurity and unemployment (NEPAD, 2013). The ASIF represents a common agenda for addressing education and skills improvement for the whole agriculture knowledge systems both at regional and country level. As suggested by TEAM-Africa (2013) the framework provides pathways for institutional reforms, curricular review and leveraging multi-consortia private – public partnerships on agriculture education and skills development to drive innovative solutions and value addition in agriculture.

Didactics concepts such as expositive: strategy based on reception learning (lectures, demonstrations, discussion, role play) and discovery: through own observation and activities (projects and research) are common and have been widely used in Agriculture to inculcate learning and extension among farmers (FAO, 1997). Andragogy and adult learning theories such as tacit and informal theories (Moshman and Schraw, 1995) identifies adults as self directed, take responsibility of their own action and resist information arbitrarily imposed on them. Adults are task motivated and adult training is done to satisfy a certain goal and the primary component of their learning motivation tends to be internal. Tacit theory frames the acquisition of metacognitive skills as occurring without any specific learning framework. According to Schraw and Moshman, 1995), adult learners acquire their metacognitive skills from their peers, local culture and role models. Agriculture training institutions use both concepts and aspects such as participant orientation, action orientation and participation self organization. Recent developments in didactics are moving towards creating a learning environment that promotes exchange of experience across the boundaries. The training goals are to provide students with professional, methodical and competences to deal with the dynamic and complex demands of commercial farming and agro business management, hence curricula and syllabi have evolved from focus on subject specific technical knowledge to methodical and social competences (DSE, 1999; Newcom et al., 1993).

Didactical tools for learning at educational levels usually emphasize cognitive aspects (Vazquez, 2009) and focus student attention on application of theory into practice. Including field research as a part of class room practice is a way of advancing the concept and art of science. The traditional training systems to produce public servants and entrepreneurs are outdated and do not fit the current end-users’ needs which are gradually shifting towards problem solving skills and market driven economy. Africa Union (2012) report retaliates that agriculture efficiency is now knowledge based and productivity increases exponentially as the level of education of practitioners increase. Therefore agriculture enhancement skills should be able to the objectives and mindset of the learner or agriculturists. There is need to marry the agricultural didactics with research centers to develop strategies that have high uptake on the market. Hess (2013) has presented an agriculture learning trajectory from primitive agriculture of 1850s to specialized education and training in the 20 th century, which is meant to provide guidance and support to adapt training programs for providing skills and competencies to present-day agriculture demands. Agriculture learning and teaching dynamics should match the learning paradigm with execution of skills taught for enhancement of agriculture production. More advance approaches to didactical concepts have been suggested by Dopico and Garcia-Vazquez., (2009); FAO (2000) and Subbarao and Raney (1994) to include both modularized and group participation delivery systems.

Products from these institutions are capable of interacting with politician, specialists and executives for collective agriculture development. The universal goal of training is to equip the trainers with adequate tools for production to meet requirements of agro-processors that use agricultural products as raw materials. The study sought to investigate how broad developments in the field of didactics ( i.e. concepts, principles, science and art of training) and methods are being adopted and used to enhance excellence in education, training and ultimately the standard of living of Zimbabwe whose livelihood is derived from agriculture. The agenda of the study is to provide solutions to real agro-business problems and to emphasize on the use of practicals as an act of convergence between theoretical knowledge and application skills in real farming situations.

**METHODOLOGY**

**Study area**

The study was conducted in Umzingwane district of Matabeleland south province in Zimbabwe. Umzingwane district is located at an altitude of 1360 m above sea level. Its’ mean annual rainfall and temperature ranges between 450-650 mm and 25-30oC, respectively. The district is dominated by livestock production with minor commercial crop and horticultural production. The area has mixed rangelands comprised chiefly of Heteropogon, Andropogon and Hyparrhenia grass species. The dominant trees are Acacia spp, Terminalia sericca, Dichrostachys cinera, Ziziphus mucronata, and Combretum apiculatum.

**Data collection**

A total of 65 farmers were randomly interviewed using a structured questionnaire. The questionnaire was pilot tested on subset participants. Data captured included the
demographic variables such as; sex of household head, level of education. The method of collecting information was adopted with transparent format: getting answers through short semi-structured questions. The survey was pilot tested to five participants per question. The pretest was meant to glean out irrelevant and reorganize negatively phrased questions. Questions adopted had positive coefficients of 0.61 based on Principal Component Analysis (PCA). The main aspects of the questionnaire are provided on the table below:

### Statistical analysis

The data were analyzed using SPSS (2002) to give descriptive statistics. Chi-square tests were used to determine association among various learning models and methods and socio-demographic characteristics.

### RESULTS AND DISCUSSION

The majority of the respondents (60 %) were aged over 50 years while 38% were aged between 25 and 50 years old. Of the total respondents, 75% were male while 25% were female. About 13 % of the interviewed farmers had primary, 74% secondary 3 % no educational qualifications, respectively. The comparably high standards of education in this sector can be exploited in the introduction of new technologies in innovation application and technology such use of e-library.

Most farmers preferred relaxed and unstraining environment of learning. Learning by doing was observed to be the most common model farmers enjoyed. While 17% of the participants cited participatory appraisal, learning through question and answer style was less common. Other methods cited were individual farmer sessions (1.3%), use of sms (1%) and open or field days (1.4%).

The world of teaching literacy skills to adults in the context of developing societies is both complex and changing. These findings (Table 3,) are comparable to Molar (1998) who observed a strong correlation (r=0.854) between demonstrations and word instruction in traditional (rural) audience aged 50 years. Helt (1996) note that non-formal education in adult agriculturist has always yielded better results in terms of introducing and application of new innovations. Furthermore, Hess (2013) has proven and agrees with Moshan and Schraw (1995) that multivariate tacit theories are the basis to underpin adult learning since adults are self directed and goal oriented. This study observed that there was an association in the use of non formal methods in adult
CONCLUSION

The importance of adult education in development cannot be overstated. Adult education is one of the pillars for sustainable development. Developmental educators can use several strategies to help adult learners integrate into their new collegiate environment. Adult learners tend to be more self-directed and task or goal-oriented than traditional students, so it is important to frame learning strategies in a way that allows adult learners to see the purpose of the exercises; otherwise, adult learners may resist new strategies. Adult education should, first of all, be community-oriented. The content of such education should involve life in its entirety and try to impart to individuals and to the community all the skills needed to manage one’s life. Functional literacy programs should focus on basic learning needs and problem solving capacity so to foster the participation of the beneficiaries. New development in the field of didactics should reinforce the roles of functional literacy as an indispensable factor in promoting sustainable development. Some developments in the field of didactics are in harmony with training methods and approaches but they underscore the importance of matching training goals to individual, sectors and national skills. There is need to rationalize and select cost effective teaching methods that give due consideration to institutional and national resource.

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Table 3. Preferred methods of learning

<table>
<thead>
<tr>
<th>Method</th>
<th>Preference %</th>
</tr>
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<tbody>
<tr>
<td>Conventional</td>
<td>6</td>
</tr>
<tr>
<td>Demonstrations</td>
<td>63</td>
</tr>
<tr>
<td>Participatory appraisal</td>
<td>17</td>
</tr>
<tr>
<td>Question and answer (oral)</td>
<td>10</td>
</tr>
<tr>
<td>Other</td>
<td>4</td>
</tr>
</tbody>
</table>

literacy, that is between demonstrations and word instruction ($X^2=11.67, p<0.05$). However, there was no association between participatory appraisal conventional methods ($X^2=3.451, p>0.001$). Similarly, there was a weak correlation between the classic methods ($r=0.123$). As indicated by Newcom et al., (1993), traditional audience (rural) farmers prefer a more open space of learning environment that allows free will participation and involvement. The Agriculture Education Skills Improvement Framework as suggested by NEPAD (2013) has identified learning methodologies based on field participation, practice and role models. The initiatives of AESIF concur with the outcome of this research. The research revealed that while 17% of the participants prefer group study works and participatory appraisals (Table 3), the bulk of the farmers (more than 70%) indicated hands-on studies as more meaningful. The results correspond with Subbarao and Raney (1994) and AU (2012) who reported that while training manuals are essential in the support of pedagogy, more emphasis should be placed in application of knowledge on the field. Dopico and Vazquez (2009) have indicated that more advanced didactical concepts have also considered both modularized and full-time delivery models.
June 2013: 35p
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Accepted 18 January, 2016


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