6FKRRO 3XEOLF 6SHFLDO $FDGHPLF

/,%5$5<,16758&7,21 5281' 7$%/(1(:6

᪽

/,57

7KH SXUSRVH RI/O57 LV WR DGYRFDWH OLEUDU\ LQVWUXFWLRQ DV D PHDQVIRU GHYHORSLQJ FRPSHWHQW W
OLEUDU\ DQG LQIRUPDWLRQ XVH DV D SDUW RIOLIHORQJ OHDUQLQJ

-XQH   YROXPH  QR  LVVQ  

IURP WKH ವ

SUHVLGHQW %\.DUL /XFDV NOXFDVWLQLFVGHGX

WKH

$SULO    6DQ -RVH 0HUFX]\ 1HZV,W VXPV XS WKH
WUDQVLWLRQ SXEOLF OLEUDULDQV DUH IDFLQJ ZLWK WKH RQVODXJKW
RI GHPDQG IRU,QWHUQHW DFFHVV DQG SDUWLFXODUO\ WKH
WUDLQLQJ WKDW RI QHFHVVLW\ JRHV DORQJ ZLWK LW 7KH DUWLFOH
DOVR UHSRUWV IUHH WZRKRXU 6DWXUGD\,QWHUQHW FODVVHV WKH UHIHUHQFH GHSDUWPHQW OLEUDULDQV RIIHUV 6HVVLRQV DUH IXOO DQG GHPDQG KDV RYHUZKHOPHG VXSSO\

0RVW QHZVSDSHU DQG PDJD]LQH DUWLFOHV WRGD\ WDON DERXW WKH JOREDO YLOODJH DQG WKH YLUWXDO FRPPXQLW\ DQG WKH

/,57 V 7RS 7ZHQW\
IRU  

%\ WKH &RQWLQXLQJ (GXFDWLRQ &RPPLWWHH 0DULOHH %LUFKILHOG &KDLU

%UDQFK.DWKHULQH DQG 'HEUD *LOFKULVW /LEUDU\ ,QVWUXFWLRQ DQG,QIRUPDWLRQ /LWHUDF\ LQ &RPPXQLW\ DQG 7HFKQLFDO &ROOHJHV 54  6XPPHU  


3URYLGLQJ D FOHDU DQG FRPSUHKHQVLYH RYHUYLHZ WKLV DUWLFOH WUDFHV KLVWRULFDO WUHQGV LQ WKH LQVWUXFWLRQ LQ

FRPPXQLW\ DQG WHFKQLFDO FROOHJHV DQG GHVFULEHV WKHLU XQLTXH FKDOOHQJHV RI GLYHUVLW\ LQ WKH VWXGHQW ERG\ DQG FRPPLWPHQW WR WKH PLVVLRQ RI WHDFKLQJ FRQWLQXHG RQ SDJH 

SXEOLF OLEUDULHV UROH LQ SURYLGLQJ DFFHVV <HW DOPRVW
QR DUWLFOHV WDON DERXW WKH KRZ WKH OLEUDULDQV ZKR ZRUN

LQ WKHVH OLEUDULHV DUH VXSSRVHG WR DFTXLUH WKH VNLOOV QHFHVVDU\ WR IXQFWLRQ LQ WKLV QHZ HQYLURQPHQW,W
VHHPV FOHDU IURP WKH IRFXV RI WKHVH DUWLFOHV WKDW RQH

RI WKH VNLOOV WKH SXEOLF QRW RQO\ H[SHFWV EXW DVVXPHV OLEUDULDQV KDYH ��6葀犀䠀
� H�P�H�U�J�L�Q�J WHFKQRORJ\ HVSHFLDOO\ WKH,QWHUQHW
7KH HYROXWLRQ RI WKH,QWHUQHW DQG SDUWLFXODUO\ WKH :RUOG:LGH:HE DV DQ LQIRUPDWLRQ GHOLYHU\ V\VWHP VHDUFKHG E\ HQGXVHUV FDXVHV HDFK DQG HYHU\ OLEUDULDQ ZKR GHDOV ZLWK WKH SXEOLF WR EH D WHDFKHU LQ ZD\V WKH\ PD\ QHYHU KDYH DQWLFLSDWHG
FRQWLQXHG RQ SDJH  

,16,'(

6$1)5$1&,6&2 118/ &21)(5(1&(

/,57 0HHWLQJV S 
/O57 3URJUDP )RFXV RQ WKH 6WXGHQW S 
%,7(6 ZLWK /O57 S 
%RRWK 9ROXQWHHUV 1HHGHG S 
$&5/,6 3UHFRQIHUHQFH S 

$57,&/(6

(\H RQ,QVWUXFWRUV 0DNLQJ 6PRRWK
7UDQVLVWLRQV E\.DUL /XFDV S 

&2/8016

&KHFN 7KHVH 2XW S 
0HPEHU$/,57 S
7HFK 7DON S 

%,%/,272216 S 

%\ 0DUFLD.LQJ%ODQGIRUG PNLQJEO#XWQHWXWROHGRHGX

2Q 6XQGD\ -XQH     DW $/$$QQXDO WKH  /,57 SURJUDP ZLOO IHDWXUH )RFXV RQ WKH 6WXGHQW (PSKDVL]LQJ /HDUQLQJ 6W\OHV 7KLV LQIRUPDWLYH SURJUDP ZLOO KRVW D SDQHO SUHVHQWDo WLRQ WKDW ZLOO H[SODLQ H[DPLQH DQG H[SORUH KRZ VWXGHQWV OHDUQ LQ WRGD\ V HOHFWURQLF OLEUDULHV 7KH SUHVHQWHUV DUH 'HEUD -RQHV,QWHUQHW /LEUDULDQ &DEULOOR &ROOHJH *DLO -XQLRQ0HW] 3UHVLGHQW,QIRUPDWLRQ $JH &RQVXOWDQWV DQG /\QQ 6XWWRQ 'LUHFWRU 8QGHUJUDGXDWH /LEUDU\ :D\QH 6WDWH 8QLYHUVLW\ (DFK SUHVHQWHU ZLOO RIIHU D ORRN DW D SDUWLFXODU DVSHFW RI OHDUQLQJ 0V -XQLRQ0HW] ZLOO ORRN DW ZKDW HYHU\ OLEUDULDQ QHHGV WR NQRZ DERXW OHDUQLQJ VW\OHV /\QQ 6XWWRQ ZLOO RXWOLQH KRZ WKH QHZ XQGHUJUDGXDWH OLEUDU\ DW:D\QH 6WDWH 8QLYHUVLW\ KDV IRFXVHG
RQ VWXGHQW OHDUQLQJ LQ LWV GHVLJQ DQG VHUYLFHV DQG 'HEUD -RQHV ZLOO SUHVHQW FULWLFDO WKLQNLQJ DV
D NH\ FRPSRQHQW RI VWXGHQW OHDUQLQJ 3ODQ RQ DWWHQGLQJ DQG SDUWLFLSDWLQJ LQ WKLV LQIRUPDWLYH VHVVLRQ 7KHUH ZLOO EH KDQGRXWV DQG ELEOLRJUDSKLHV WR DGG WR \RXU WHDFKLQJ SRUWIROLRV 6HH
\RX LQ 6DQ)UDQFLVFR ವ

/O57 1HZV-XQH  

(\H RQ,QVWUXFWRUV 0DNLQJ 6PRRWK 7UDQVLWLRQV
E\.DUL /XFDV NOXFDV#XFVGHGX

$V DQ LQVWUXFWRU PDNLQJ VPRRWK WUDQVLWLRQV EHWZHHQ
WRSLFV LQ \RXU LQVWUXFWLRQDO VHVVLRQV LV D VXEWOH \HW
LPSRUWDQW FRQVLGHUDWLRQ 7UDQVLWLRQV DUH FXHV WR OHW
\RXU OHDUQHUV NQRZ WKDW \RX DUH PRYLQJ RQ WR VRPHo
WKLQJ QHZ *RRG WUDQVLWLRQV DUH VHDPOHVV HDVLO\ FRQQHFWLQJ ZKDW \RX KDYH DOUHDG\ FRYHUHG WR ZKDW \RX ZLOO EH GLVFXVVLQJ QH[W

7KHUH DUH PDQ\ WHFKQLTXHV IRU OLQNLQJ YDULRXV SDUWV RI ZKDW \RX DUH WHDFKLQJ /LVWHG EHORZ DUH MXVW D IHZ WKDW DUH SUDFWLFDO DQG HDV\ WR UHPHPEHU DQG WR LQFRUSRUDWH LQWR \RXU WHDFKLQJ VW\OH

 5HIHUHQFHV WR SHULRGV RI WLPH 0HQWLRQLQJ VSHFLILF SHULRGV RI WLPH WRGD\ WKLV PRUQLQJ WKLV DIWHUo QRRQ KHOSV OHDUQHUV WR RUJDQL]H WKH VHFWLRQV RI \RXU LQVWUXFWLRQ LQ WKHLU PLQGV DQG JLYHV WKHP D FOHDU LQGLFDWLRQ RI ZKHUH \RX DUH KHDGHG

7KLV PRUQLQJ ZH WRRN D ORRN DW ZKDW QRW WR GR LQ DQ ,QWHUQHW VHDUFK WKLV DIWHUQRRQ ZH ZLOO EH IRFXVLQJ RQ ZKDW VWHSV \RX VKRXOG WDNH WR HQVXUH JRRG VHDUFK
UHVXOWV

 0LQLVXEMHFW UHYLHZ 7DNLQJ D IHZ PRPHQWV WR
UHYLHZ ZKDW KDV EHHQ FRYHUHG DOORZV OHDUQHUV WR UHIOHFW

RQ ZKDW WKH\ KDYH DOUHDG\ OHDUQHG DQG WR SUHSDUH WKHPVHOYHV IRU WKH QH[W SDUW RI WKH VHVVLRQ

/HW V TXLFNO\ UHYLHZ ZKDW ZH YH FRYHUHG VR IDU EHIRUH ZH PRYH RQ WR RXU QH[W WRSLF RI

&��R �C•

FR

67587 <285 678))

RQ WKH,QVWUXFWLRQDO 6XSHUKLJKZD\O

,PLWDWLRQ LV WKH VLQFHUHVW IRUP RI IODWWHU\
0DNH LW HDV\VHQG XV WZR FRSLHV RI
\RXU ODWHVW JUHDWHVW KDQGRXWV IRU
GLVSOD\ LQ WKH /,57 ERRWK DW
6DQ)UDQFLVFR,I \RX YH
GRQH D 3RZHUSRLQW
SUHVHQWDWLRQ
SOHDVH SULQW
RXW WKH
VOLGHV

/LQGD - *RII

/LEUDU\,QVWUXFWLRQ /LEUDULDQ &DOLIRUQLD 6WDWH 8QLYHUVLW\ 6DFUDPHQWR  6WDWH 8QLYHUVLW\ 'ULYH (DVW 6DFUDPHQWR &$  
  )$;   ,MJRII#FVXVHGX

^URP WKH

SUHV,GHQW m O,O,,,,&G WOOOOOOL JH  

2QH H[DPSOH \RX FDQ GRZQORDG IURP WKH 6W -RVHSK &RXQW\ 3XEOLF /LEUDU\ 6-&3/  6RXWK %HQG,QGLDQD 85/ KWWS VMFSOLELQXV LV D 3RZHU 3RLQW VOLGH SUHVHQWDWLRQ WKDW LV XVHG LQ WKHLU,QWHUQHW WUDLQLQJ,W LV DLPHG VSHFLILFDOO\ DW OLEUDU\ VWDII ZKR DUH EHJLQQLQJ ,QWHUQHW WUDLQLQJ SURJUDPV IRU SDWURQV 7KLV VOLGH VKRZ QRWHV WKUHH RWKHU SXEOLF OLEUDU\ H[DPSOHV RI,QWHUQHW WUDLQLQJ SURJUDPV %XIIDOR (ULH &RXQW\ 3XEOLF /LEUDU\ 1<  &KDUORWWH0HFNOHQEXUJ 3XEOLF /LEUDU\ 1&  DQG:HVW %ORRPILHOG 3XEOLF /LEUDU\ 0, ,I \RX DUH LQWHUHVWHG LQ VHDUFKLQJ D OLVW RI RYHU  SXEOLF OLEUDULHV WR VHH ZKDW NLQGV RI,QWHUQHW WUDLQLQJ SURJUDPV WKH\ RIIHU WDNH D ORRN DW WKH:HE VLWH IURP WKH 0LOWRQ 3XEOLF /LEUDU\ 0$ 85/ KWWS ZZZWLDFQHWO XVHUVPSO ,W SURYLGHV DQQRWDWLRQ IRU HDFK OLEUDU\ DQG
LQGLFDWHV WKH VLWH V EHVW RU ZRUVW IHDWXUHV
/,57 1HZV-XQH  

/,57 LV FRPPLWWHG WR SURYLGLQJ VXSSRUW WR DQ\ OLEUDUo LDQ WKDW WHDFKHV UHJDUGOHVV RI OLEUDU\ W\SH /,57 PHPEHUVKLS UHIOHFWV D ULFK YDULHW\ RI OLEUDULDQVKLS /,57 SURGXFHV SUDFWLFDO KDQGVRQ PDWHULDO WR DLG WKH OLEUDULDQ LQVWUXFWRU ZKHWKHU QRYLFH RU H[SHULHQFHG

/,57 LV XQLTXH LQ LWV PXOWLOLEUDU\ DSSURDFK:LWKLQ /,57 WKHUH LV JUHDW RSSRUWXQLW\ IRU FURVVIHUWLOL]DWLRQ DPRQJ OLEUDULDQV ZKR KDYH WKH VDPH GHPDQGV SODFHG RQ WKHP $OORZ \RXUVHOI WR WDNH DGYDQWDJH RI D WUHPHQo GRXVO\ ULFK UHVRXUFH

3OHDVH MRLQ XV IRU )RFXV RQ WKH 6WXGHQW WKH /,57   $QQXDO &RQIHUHQFH SURJUDP

W

&+(&. 7+(6(287

 0DU\ 3DJOLHUR 3RSS SRSS#LQGLDQDHGX

2XU FROOHDJXHV LQ EXVLQHVV DQG HGXFDWLRQDO WUDLQLQJ RIWHQ KDYH JRRG LGHDV OLEUDULDQV FDQ XVH)RU WKLV LVVXH , KDYH SXOOHG WRJHWKHU XVHIXO UHFHQW DUWLFOHV IURP WKH HGXFDWLRQ DQG WUDLQLQJ OLWHUDWXUH

$ VHULHV RI FROXPQV LQ WKH -DQXDU\)HEUXDU\ DQG
0DUFK

� DP@x&•…’GdD�F�

HPEHU $/,57

/\QQ 2VVROLQVNL

7KLV LVVXH V 0HPEHU $/,57 SURILOHV D ODG\ ZKR LV
YHU\ LPSRUWDQW WR WKLV URXQG WDEOH /\QQ 2VVROLQVNL WKH    /,57 3UHVLGHQW /\QQ EULQJV WR /,57 H[WHQVLYH RUJDQL]DWLRQDO H[SHULHQFH DV ZHOO DV D WUXH ORYH RI WKH SURIHVVLRQ +HU FXUUHQW SRVLWLRQ LV DV WKH OLEUDULDQ DW,QFOLQH +LJK 6FKRRO ORFDWLQJ KHU LQ WKH
6LHUUD 1HYDGD 0RXQWDLQV RQ WKH 1RUWK 6KRUH RI /DNH 7DKRH 6KH LV DOVR DQ DFWLYH YROXQWHHU WXWRU DQG WUDLQHU

IRU WKH 5HDGLQJ &HQWHU RI 1RUWK 7DKRH D OLWHUDF\ SURJUDP WKDW VKH IRXQGHG 3DVW H[SHULHQFH LQFOXGHG D JXEHUQDWRULDO DSSRLQWPHQW DV WKH 'LUHFWRU RI WKH 1HYDGD /LWHUDF\ &RDOLWLRQ:KLOH VKH HQMR\HG WKH MRE LW WRRN KHU WRR IDU IURP OLEUDU\ ZRUN 7KLV VXPPHU VKH ZLOO EH WHDFKLQJ D OLEUDU\ VFLHQFH FODVV RQ 1RQo 3ULQW 0DWHULDOV IRU WKH 8QLYHUVLW\ RI 1HYDGD DW 5HQR

/\QQ KDV EHHQ LQYROYHG ZLWK /,57 IRU VHYHUDO \HDUV VHUYLQJ DV WKH 6HFUHWDU\ LQ   DQG VHUYLQJ RQ WKH SODQQLQJ WHDP IRU WKH WK $QQLYHUVDU\ HYHQWV GXULQJ WKH ODVW 6DQ)UDQFLVFR FRQIHUHQFH 6KH SODQQHG WKH
/,57 RIILFHUV OXQFKHRQ DQG XVHG KHU FRQQHFWLRQV WR

OLQH XS VFLHQFH ILFWLRQ DXWKRU 5REHUW 6LOYHUEHUJ IRU WKH /,57 SDQHO GLVFXVVLRQ SURJUDP /\QQ ZDV LQLWLDOO\ DWWUDFWHG WR /,57 EHFDXVH RI WKH VSHFLDO VSLULW RI WKH RUJDQL]DWLRQ 6KH HVSHFLDOO\ IRXQG LW WR EH RSHQ IULHQGO\ DQG DFFHVVLEOH DQG UHDOO\ OLNHG WKH IDFW WKDW PHPEHUV FDQ JHW DFWLYHO\ LQYROYHG E\ MXVW VLJQLQJ XS
RQ WKH YROXQWHHU IRUP LQ WKH QHZVOHWWHU

2WKHU SURIHVVLRQDO VHUYLFH KDV LQFOXGHG VHUYLQJ DV WKH SUHVLGHQW RI WKH 1HYDGD /LEUDU\ $VVRFLDWLRQ LQ   DQG FXUUHQWO\ FKDLULQJ WKH,QWHOOHFWXDO)UHHGRP &RPo PLWWHH 6KH KDV EHHQ WKH 1HYDGD 5HSUHVHQWDWLYH RQ WKH $IILOLDWH $VVHPEO\ IRU WKH $PHULFDQ $VVRFLDWLRQ RI 6FKRRO /LEUDULDQV $$6/  $GGLWLRQDOO\ /\QQ KDV EHHQ YHU\ DFWLYH LQ WKH 0RXQWDLQ 3ODLQV /LEUDU\ $VVRFLDWLRQ 03/$  ZLWK UHVSRQVLELOLWLHV WKDW LQo FOXGHG EHLQJ WKH &KDLU RI WKH 6FKRRO DQG &KLOGUHQ V /LEUDU\ 6HFWLRQ VHUYLQJ RQ WKH &RPPXQLW\ *UDQWV &RPPLWWHH DQG WDNLQJ RQ WKH FKDOOHQJH RI FKDLULQJ WKH &RQYHQWLRQ FRPPLWWHH IRU WKH MRLQW PHHWLQJ RI WKH

E\ 3L[H\ $QQH 0RVOH\
SPRVOH\#WDPXHGX

1HYDGD /LEUDU\ $VVRFLDWLRQ DQG 03/$ 7KH UDWWHU ZDV
D

Tၜ䠀圀嚠唀䠀儀䰆①虀΀

異堠䠀

FRQWLQXHGIURP SDJH  

/,57 V 7RS 7ZHQW\
IRU  

 

%UDQGW' 6FRWW 8VLQJ /HDUQLQJ 7HDPV LQ,QWHUQHW 7UDLQLQJ &RPSXWHUV LQ /LEUDULHV  -DQXDU\
  

'HVFULEHV WKH SODQQLQJ DQG RXWFRPH RI WUDLQLQJ SURYLGHG E\ DFDGHPLF OLEUDULDQV WR. PHGLD VSHFLDOLVWV DQG WHDFKHUV (QGV ZLWK DGYLFH EDVHG RQ WKHLU H[SHULHQFH

'DUDJDQ 3DWULFLD DQG *ZHQGRO\Q 6WHYHQV 'HYHORSo LQJ /LIHORQJ /HDUQHUV $Q,QWHJUDWLYH DQG 'HYHORSo PHQWDO $SSURDFK WR,QIRUPDWLRQ /LWHUDF\
5HVHDUFK 6WUDWH᪽LHV  6SULQJ   

5HYLHZV 3HUU\ V GHYHORSPHQWDO PRGHO DQG WKH LPSOLFDWLRQV IRU OLEUDU\ LQVWUXFWLRQ 'HVFULEHV WKH OLEUDU\ LQVWUXFWLRQ FRPSRQHQWV D FROOHJH RIIHUHG GXULQJ WKH ILUVW \HDU RI D SODQQHG IRXU\HDU SURJUDP DQG UHSRUWV RQ SUH DQG SRVWWHVW VFRUHV

'H+DUW %ULDQ -RE 6HDUFK 6WUDWHJLHV /LEUDU\ ,QVWUXFWLRQ &ROODERUDWHV ZLWK 8QLYHUVLW\ &DUHHU 6HUYLFHV 5HIHUHQFH /LEUDULDQ    

'HVFULEHV FROODERUDWLYH HIIRUWV EHWZHHQ WKH OLEUDU\ DQG WKH XQLYHUVLW\ SODFHPHQW RIILFH DW 'H3DXO 8QLYHUVLW\ ZKLFK KDV UHVXOWHG LQ VWXGHQWV LQo
FUHDVHG XVH RI OLEUDU\ UHVRXUFHV LQ SUHSDULQJ IRU WKH MRE PDUNHW

'HPSVH\ 3DXOD 5 )RFXVLQJ RQ WKH ([SHUWV 0DSSLQJ 5HVRXUFHV LQ DQ,QWHUGLVFLSOLQDU\)RFXV $UHD 5HVHDUFK 6WUDWH᪽LHV  6XPPHU   

'HVFULEHV DQ DVVLJQPHQW XVHG LQ D JUDGXDWH LQWHUo GLVFLSOLQDU\ FRXUVH ZKLFK SURYLGHV WKH VWXGHQWV
ZLWK DQ RYHUYLHZ RI UHVHDUFK WRROV LQ DQ LQWHUDFWLYH

ZD\

(DUO 0DUWKD) HW DO )DFXOW\,QYROYHPHQW LQ 3UREOHPo %DVHG /LEUDU\ 2ULHQWDWLRQ IRU)LUVW<HDU 0HGLFDO 6WXGHQWV %XOOHWLQ RI WKH 0HGLFDO /LEUDU\ $VVRFLDo WLRQ  -XO\   

O2/L57 1HZV-XQH  

'HVFULEHV WKH XVH RI OLEUDULDQV DQG QRQOLEUDULDQ

IDFXOW\ DV IDFLOLWDWRUV LQ D FDVH VWXG\ DSSURDFK WR LQWURGXFLQJ PHGLFDO VWXGHQWV WR WKH OLEUDU\

)R[ /\QQH 0 -XGLWK 0 5LFKWHU DQG 1DQF\ (:KLWH $ 0XOWLGLPHQVLRQDO (YDOXDWLRQ RI D 1XUVLQJ ,QIRUPDWLRQ/LWHUDF\ 3URJUDP %XOOHWLQ RI WKH 0HGLFDO /LEUDU\ $VVRFLDWLRQ  $SULO   
 

D

�W�T�@��r�/�‘5G$L�R@�q$@ð�D

� 0ð5D�Teð

FRQWLQXHGIURP SDJH 

/,57 V 7RS 7ZHQW\
IRU  

0DSOH $PDQGD %HWK &KULVWHQVHQ DQG.DWKOHHQ $ $EURPHLW ,QIRUPDWLRQ /LWHUDF\ IRU 8QGHUJUDGXDWH 0XVLF 6WXGHQWV $ &RQFHSWXDO)UDPHZRUN 1RWHV
 0DUFK   

%DVHG RQ WKH SUHPLVH WKDW FROOHJH JUDGXDWHV PXVW
EH LQIRUPDWLRQ OLWHUDWH WKLV DUWLFOH IRFXVLQJ VSHFLILFDOO\ RQ PXVLF VWXGHQWV H[DPLQHV WKH IRXU HOHPHQWV RI DQ LQIRUPDWLRQJDWKHULQJ SURFHVV WKDW
DUH LQFOXGHG LQ $&5/ V 0RGHO 6WDWHPHQW RI

2EMHFWLYHV IRU $FDGHPLF %LEOLRJUDSKLF,QVWUXFo
WLRQ

0DUWRUDQD -DQHW DQG &DURO 'R\OH &RPSXWHUV 2Q &ULWLFDO 7KLQNLQJ 2II &KDOOHQJHV RI 7HDFKLQJ LQ WKH (OHFWURQLF (QYLURQPHQW 5HVHDUFK 6WUDWHJLHV
 6XPPHU    

,GHQWLILHV REVWDFOHV WR WHDFKLQJ DQG OHDUQLQJ LQ D FRPSXWHUHTXLSSHG FODVVURRP DQG WKH GLVWUDFWLRQ RI WKLV HQYLURQPHQW WR WKH WHDFKLQJ RI FULWLFDO WKLQNLQJ VNLOOV $SSURDFKHV DQG VWUDWHJLHV WR GHo HPSKDVL]H WKH PHFKDQLFDO DVSHFWV RI WKH V\VWHP LQWHUIDFH DQG UHIRFXV RQ FULWLFDO WKLQNLQJ DUH SUHVHQWHG

1DKO 'LDQH DQG 9LROHW + +DUDGD &RPSRVLQJ %RROHDQ 6HDUFK 6WDWHPHQWV 6HOI&RQILGHQFH &RQFHSW $QDO\VLV 6HDUFK /RJLF DQG (UURUV 6FKRRO /LEUDU\ 0HGLD 2XDUWHUO\  6XPPHU
   

5HSRUWV WKH UHVXOWV RI DQ H[SHULPHQW GHVLJQHG WR
WHVW VHFRQGDU\ VWXGHQWV DELOLW\ WR LQWHUSUHW DQG
FRQVWUXFW VHDUFK VWDWHPHQWV 5HYLHZV UHODWHG

UHVHDUFK RQ SUREOHPV HQFRXQWHUHG E\ QRYLFH VHDUFKHUV LQIOXHQFHV RI ODQJXDJH DELOLW\ DIIHFW DQG JHQGHU GLIIHUHQFHV DQG HIIHFWLYHQHVV RI SRLQWo RIXVH ZULWWHQ LQVWUXFWLRQV &RQFOXGHV ZLWK LPSOLo
FDWLRQV IRU RQOLQH LQVWUXFWLRQ

2EHUPDQ &HULVH /LEUDU\,QVWUXFWLRQ &RQFHSWV DQG 3HGDJRJ\ LQ WKH (OHFWURQLF (QYLURQPHQW SUHVHQo WDWLRQ JLYHQ DW WKH 6FKRRO RI /LEUDU\ DQG,QIRUPDo WLRQ 6WXGLHV 7H[DV:RPDQ V 8QLYHUVLW\
0D\   54  6SULQJ   

$ WKRXJKWSURYRNLQJ SLHFH RQ WKH FKDQJLQJ DQG XQFKDQJLQJ PLVVLRQ RI LQVWUXFWLRQ OLEUDULDQV LQ WKH GLJLWDO DJH

5DELQRZLW] &HOLD 5HVHDUFK LQ 7HDFKLQJ $ &RXUVH WR %ULGJH WKH 7KHRU\3UDFWLFH *DS 5HVHDUFK 6WUDWH JLHV  6SULQJ    

'HVFULEHV DQ XQGHUJUDGXDWH HGXFDWLRQ FRXUVH WHDP WDXJKW E\ D OLEUDULDQ DQG IDFXOW\ PHPEHU ZKLFK LQWHJUDWHV LQVWUXFWLRQ LQ OLEUDU\ UHVHDUFK DQG ILHOG UHVHDUFK WR KHOS DGGUHVV WKH GLVSDUDWH XVH RI WKHRUHWLFDO UHVHDUFK E\ WHDFKHUV

6ORDQ 6WHYH 7KH 9LUWXDO 3DWKILQGHU $:RUOG:LGH :HE *XLGH WR /LEUDU\ 5HVHDUFK &RPSXWHUV LQ /LEUDULHV  $SULO   

7KLV LV D EULHI DUWLFOH GHVFULELQJ WKH FUHDWLRQ RI WKH YLUWXDO SDWKILQGHU DW WKH 8QLYHUVLW\ RI 1HZ

%UXQVZLFN,Q FUHDWLQJ WKH SURJUDPV �

IRU怄�Eу荒8QLYHU

� �H� �8Q �I v‰� A50@1@„$6�Xp@ð€

/,57 V 7RS 7ZHQW\
IRU  

ವ FRQWLQXHGIURP SDJH 

6WDLQHV *DLO 0 0RYLQJ %H\RQG,QVWLWXWLRQDO %RXQGDULHV 3HUFHSWLRQV 7RZDUG %, IRU 7UDQVIHU 6WXGHQWV 5HVHDUFK 6WUDWHJLHV  6SULQJ  


5HSRUWV RQ D VXUYH\LQWHUYLHZ VWXG\ RI OLEUDULDQV
IURP FRPPXQLW\

/($51,1* 72 7($&+

$&5/,QVWUXFWLRQ 6HFWLRQ V   3UHFRQIHUHQFH

$&5/ V,QVWUXFWLRQ 6HFWLRQ LV KROGLQJ D SUHFRQIHUo HQFH /HDUQLQJ WR 7HDFK :RUNVKRSV RQ,QVWUXFo WLRQ RQ)ULGD\ -XQH    7KLV LV D RQHGD\ SUHFRQIHUHQFH WR WKH DQQXDO PHHWLQJ RI$/$ LQ 6DQ)UDQFLVFR 7KH SUHFRQIHUHQFH LV EDVHG RQ WKH $&5/SXEOLFDWLRQ /HDUQLQJ WR 7HDFK :RUNVKRSV RQ
,QVWUXFWLRQ

2IWHQ OLEUDULDQV OHDUQ WR WHDFK RQWKHMRE /HDUQLQJ WR 7HDFK ZDV FRQFHLYHG DV D FROOHFWLRQ RI WUDLQLQJ PRGXOHV FRYHULQJ LQVWUXFWLRQDO IXQGDPHQWDOV WR KHOS OLEUDULDQV LPSURYH WKHLU WHDFKLQJ 3DUWLFLSDQWV DUH HQFRXUDJHG WR DGDSW WKH ZRUNVKRSV DQG XVH WKHP IRU WUDLQLQJ DW WKHLU RZQ LQVWLWXWLRQV %RWK QHZ DQG H[SHULHQFHG OLEUDULDQV ZLOO ILQG WKH SUHFRQIHUHQFH
XVHIXO

7KH SUHFRQIHUHQFH ZRUNVKRSV ZLOO EH EDVHG RQ WKH RULJLQDO LQWHUDFWLYH PRGXOHV IURP /HDUQLQJ WR᪽  3DUWLFLSDQWV ZLOO EH DEOH WR DWWHQG IRXU RI
WKHVH VL[VHVVLRQV

ವ &RQWULEXWLRQV IURP WKH 3V\FKRORJ\ RI /HDUQo LQJ3UDFWLFDO,PSOLFDWLRQV IRU 7HDFKLQJ -RDQ .DSORZLW] 8&/$

ವ 3UHVHQWDWLRQ 6NLOOV DQG &ODVVURRP 0DQDJHo PHQW &ODXGHWWH +DJOH 8QLYHUVLW\ RI 'DOODV

ವ

6HOHFWLQJ D 7HDFKLQJ 7HFKQLTXH 7UXGL -DFREVRQ 681< $OEDQ\

ವ

,QVWUXFWLRQ LQ D 0XOWLFXOWXUDOO0XOWLUDFLDO

(QYLURQPHQW .DUHQ 'RZQLQJ 8QLYHUVLW\ RI 0LFKLJDQ DQG -RVHSK 'LD] 8QLYHUVLW\ RI
$UL]RQD

ವ 7KH 2QH6KRW /HFWXUH (VWKHU *UDVVLDQ 8&/$

ವ

'HYHORSLQJ (IIHFWLYH /LEUDU\ $VVLJQPHQWV &KULVWLQD:RR 8&,UYLQH 

7KH SUHFRQIHUHQFH ZLOO EH KHOG DW WKH %HUNHOH\ &RQIHUo HQFH &HQWHU D FRQYHQLHQW ULGH YLD WKH %D\ $UHD 5DSLG 7UDQVLW %$57 IURP GRZQWRZQ 6DQ)UDQFLVFR 7KH

SUHFRQIHUHQFH ZLOO EHJLQ DW   DP DQG ZLQG XS E\   SP LQ WLPH IRU SDUWLFLSDQWV WR PLJUDWH WR WKH ,QVWUXFWLRQ 6HFWLRQ GLQQHU LI GHVLUHG

5HJLVWUDWLRQ ZLOO EH OLPLWHG WR  SHRSOH DQG LQFOXGHV WKH DOOGD\ FRQIHUHQFH ZRUNVKRS VXSSRUW PDWHULDOV DQG UHIUHVKPHQWV GXULQJ WKH PRUQLQJ DQG DIWHUQRRQ  IRU $&5/ PHPEHUV  IRU $/$ PHPEHUV QRQo $&5/ PHPEHUV  IRU /LEUDU\ 6FKRRO 6WXGHQWV DQG  IRU QRQ$/$ QRQ$&5/ PHPEHUV 7KHUH ZLOO EH D  ODWH IHH IRU WKRVH UHJLVWHULQJ DIWHU WKH GHDGo OLQH 0D\    6HH WKH:HE VLWH IRU WKH UHJLVWUDo WLRQ IRUP 85/ KWWS ZZZOHODQGVWDQIRUGHGXO
 UQHVRUD$&5/,6SUHFRQKWPO! /XQFK FDQ EH SXUo
FKDVHGVd䡧☤䀄逅瀄者倀

ವ 8 RU 9VKDSHG SODFHPHQW RI ZRUNVWDWLRQV
ವ 2WKHU FRQILJXUDWLRQV

ವ

6W\OH RI ZRUNVWDWLRQV

ವ 6WDQGDUG WDEOHV ZLWK &38 V PRQLWRUV DQG NH\ERDUGV RQ WRS ORZHU FRVWV EXW &38 V DQG PRQLWRUV PD\ REVWUXFW YLVLRQ

ವ 7DEOHV DOORZLQJ SODFHPHQW RI VRPH RU DOO RI WKH HTXLSPHQW EHORZ WKH WDEOH WRS PRUH H[SHQVLYH EXW VWXGHQWV KDYH D FOHDU YLVXDO SDWK DQG WKHUH V PRUH IOH[LELOLW\ LQ XVLQJ WKH WDEOHV IRU RWKHU SXUSRVHV

ವ 3ODFHPHQW RI LQVWUXFWRU V ZRUNVWDWLRQ

ವ$W WKH IURQW RI WKH URRP IDFLQJ WKH VWXGHQWV ವ$W WKH UHDU RI WKH URRP ZKHUH VWXGHQWV FRPSXWHU PRQLWRUV FDQ EH HDVLO\ REVHUYHG

ವ 6RXQG LVVXHV

ವ 6RXQG GDPSHQLQJ DJDLQVW RXWVLGH QRLVHV
OLNH QRLV\ DLUKDQGOHUV RU SDVVHUVE\
ವ 6RXQG DPSOLILFDWLRQ IRU ERWK LQVWUXFWRUV DQG VRXQGUHODWHG WHFKQRORJLHV HVSHFLDOO\ LQ
ODUJHU URRPV ZLWK PDQ\ ZRUNVWDWLRQV

ವ

/LJKWLQJ

ವ &RQWURO RI OLJKWV IURP LQVWUXFWRU V ZRUNVWDWLRQ
ವ 0HFKDQLVPV WR GLP OLJKWV IRU SUHVHQWDWLRQV
ವ 6XIILFLHQW OLJKW DW LQVWUXFWRU V ZRUNVWDWLRQ

ವ 5RRP 5HQRYDWLRQ

ವ $VEHVWRV DEDWHPHQW

ವ (OHFWULFDO ZLULQJ RXWOHWV OLJKWV HWF
ವ 1HWZRUN FRQQHFWLRQV

ವ

7HOHSKRQH OLQHV WR FDOO IRU KHOS DQG WR FRQQHFW D PRGHP

ವ

3DLQWLQJ DQG

�b�@€�&@@ 

0r UQð™s�–H 1v–eE0

� 3�D�L�Xv(µವPA圀Ȓ䅠葴怙⠌딀

9ROXQWHHUV DUH QHHGHG WR VWDII WKH /,57

FRQWLQXHGIURP SDJH 

ವ

,GHQWLI\ WKH OHYHO RI VHFXULW\ QHHGHG

ವ

6HFXULW\ V\VWHP IRU WKH HQWLUH URRP"
ವ

6HFXULW\ RI WKH LQGLYLGXDO XQLWV LQ WKH URRP"
ವ

6HFXULW\ RI WKH VRIWZDUH DQG RSHUDWLQJ
V\VWHP RI WKH FRPSXWHUV"

ವ 7UDLQ LQVWUXFWRUV LQ XVLQJ WKH HTXLSPHQW

ವ (VWDEOLVK SROLFLHV DQG SURFHGXUHV IRU XVLQJ WKH
URRP

)RU PRUH LQIRUPDWLRQ H[DPLQH VRPH RI WKH UHo VRXUFHV OLVWHG EHORZ,Q SDUWLFXODU $GDPV H[o SORUHV PDQ\ RI WKH LVVXHV UDLVHG LQ WKH FKHFNOLVWV DQG 3DVN SURYLGHV SUDFWLFDO GHWDLOV EDVHG RQ RQH OLEUDU\ V H[SHULHQFH

$GGLWLRQDO,QIRUPDWLRQ 

$GDPV /DXUDO / 'HVLJQLQJ WKH (OHFWURQLF &ODVVo
URRP,Q 7KH,QWHUQHW)ODPHV)LUHZDOOV DQG

WKH)XWXUH 3URFHHGLQJV IRU WKH  &RQIHUHQFH RI WKH &RXQFLO IRU +LJKHU (GXFDWLRQ &RPSXWLQJ
6HUYLFHV ('   

(OPRUH *DUODQG DQG $OL -DIDUL ,PSOHPHQWLQJ WKH 9LVLRQ (OHFWURQLF &ODVVURRP 'HVLJQ DQG
&RQVWUXFWLRQ,Q 7KH (OHFWURQLF &ODVVURRP $ +DQGERRN IRU (GXFDWLRQ LQ WKH (OHFWURQLF (QYLo

URQPHQW 0HGIRUG 1- /HDUQHG,QIRUPDWLRQ ,QF  

*ORJRII 6WXDUW /LEUDU\,QVWUXFWLRQ LQ WKH (OHFo WURQLF /LEUDU\ 7KH 8QLYHUVLW\ RI $UL]RQD V (OHFWURQLF /LEUDU\ (GXFDWLRQ &HQWHUV 5HIHUo HQFH 6HUYLFHV 5HYLHZ VXPPHU   



+LQFKOLIIH /LVD -DQLFNH 3ODQQLQJ DQ (OHFWURQLF /LEUDU\ &ODVVURRP $Q $QQRWDWHG %LEOLRJUDSK\ 85/ KWWS DOH[LDOLVXLXFHGXMDQLFNH
$EVWUDFWVKWPO!

.RWODV &DURO\Q &RPSXWHU &ODVVURRP DQG /DERUDWRU\ 'HVLJQ %LEOLRJUDSK\ 85/ KWWS  ZZZLDWXQFHGXJXLGHVLUJKWPO!

3DVN -XGLWK 3XUGXH 8QLYHUVLW\ /LEUDULHV (OHFo WURQLF &ODVVURRP 85/ KWWS RPQLFF SXUGXHHGX

MPSDVN3RVWHUKWPO!

$V DOZD\V VHQG TXHVWLRQV DQG FRPPHQWV WR

6QDLO 0DLO 7HFK 7DON
%LOOLH 3HWHUVRQ

0RRG\ 0HPRULDO /LEUDU\
3 2 %R[

:DFR 7;  
(PDLO SHWHUVRQE#ED\ORUHGX ವ

%,%/,272216 %\ *DU\ +DQGPDQ



᪽ KH᪽?: 

4XW WQHU GRR
? RII
1RWH 12 RQH?!O,Q EH DOORZHG
Q ᪽H WKHD?HU D +HU᪽H WDG
RI WKH Q2U7I IOQ HOHFRPo
PYQ᪽DRQV ᪽H YHU[H I

5HSULQWHG IURP +DQGPDQ *DU\ %LEOLRWRRQV -HIIHUVRQ 1RUWK &DUROLQD 0F)DUODQG F  E\ SHUPLVVLRQ RI WKH DXWKRU

/,57 1HZV-XQH  

/,%5$5<,16758&7,21 5281' 7$%/(

 

67$1',1* &200,77((6

&20387(5 $33/,&$7,216 ([DPLQHV KRZ

FRPSXWHUV DUH XVHG LQ OLEUDU\ LQVWUXFWLRQ 3URo
PRWHV WKH XVH RI FRPSXWHUV E\ SXEOLVKLQJ D
ELEOLRJUDSK\ RQ FRPSXWHU DSSOLFDWLRQV IRU %, DQG PDLQWDLQLQJ D FOHDULQJKRXVH IRU LQIRUPDWLRQ RQ FRPSXWHU VRIWZDUH

&21)(5(1&(352*5$0 3ODQV WKH /O57

SURJUDP IRU WKH $/$$QQXDO &RQIHUHQFH 0DNHV DUUDQJHPHQWV IRU VSHDNHUV URRP KDQGRXWV DQG DFWLYLWLHV GXULQJ WKH SURJUDP

&217,18,1* ('8&$7,21 &RQGXFWV UHVHDUFK

DQG GHYHORSV SODQV DFWXDO PDWHULDOV DQG GLUHFWRo ULHV WR IXUWKHU WKH HGXFDWLRQ DQG KHOS PHHW WKH LQIRUPDWLRQ QHHGV RI OLEUDULDQV HQJDJHG LQ XVHU
HGXFDWLRQ

(/(&7,216120,1$7,1* 3UHSDUHV D VODWH RI
FDQGLGDWHV IRU /O57 RIILFHV DQG PDLQWDLQV UHFRUGV

RQ SURFHGXUHV FDQGLGDWHV DQG HOHFWLRQ UHVXOWV
6ROLFLWV YROXQWHHUV IRU /O57 FRPPLWWHHV DQG

PDLQWDLQV ILOHV RI SURVSHFWLYH FRPPLWWHH DSSRLQo
WHHV

/,$,621 $WWHQGV DQG UHSRUWV WR /O57 6WHHULQJ
&RPPLWWHH DQG PHPEHUV DERXW FRPPLWWHHV ZLWKLQ

$/$ LQYROYHG LQ OLEUDU\ LQVWUXFWLRQ DFWLYLWLHV

'LVWULEXWHV WR FRQIHUHQFH DWWHQGHHV D OLVWLQJ RI � Iɹ⼔䄦ᢑ䌣▒/LHV IȀ䜀

LQVWUXFWLRQUHODWHG SURJUDPᅡ利㝢瀄숑ġD$/$

�Q�FÂ„ó„A6ƒ5��W W� ⼷厄☀

�O0(3Ud%€ fÀ€Œ!À€p€

/LEUDU\,QVWUXFWLRQ 5RXQG 7DEOH
200,77((92/817((5)250

,I \RX DUH LQWHUHVWHG LQ VHUYLQJ RQ D /O57 &RPPLWWHH SOHDVH FRPSOHWH WKLX먄䀀

7KH /,57,QWHUQHW 7DVN)RUFH DQQRXQFHV WKH QHZ
/,57:HEVLWH

KWWS GLRJHQHVED\ORUHGX,/LEUDU\/,57

/LEUDU\,QVWUXFWLRQ 5RXQG 7DEOH 1HZV
FOR &ROHHQ 6XOOLYDQ /LDLVRQ 2IILFHU $PHULFDQ /LEUDU\ $VVRFLDWLRQ
/,57  ( +XURQ 6WUHHW