

6WDWH DQG 'HYHORS PH QW 6\*XE H DW QYH :HOO  
VWXGHQWV LQ \*XDQQ [ & Q9RYFDUWILRQ DR I \$JULFXO

;X +DQ :LFKLDQ ,QW DUDG/R R S/XO PRQ 3XQFKDWUHH

\*XDQJ[L 9RFDWLRQDO 8QÈ YDQQLWJ RX D\$QW[LIF & D MQDU H  
%DQVRPGHM FDW DRESKDDWD8 QLYHUVLW\ %DQJNRN 7KDLODQG

\$EVWUDWV WKH FRQWLQXR XWK GHYDREDS PH ERIPD WLRQ WUDRFLDO VWU  
FRQWLQXHV WR DFFHOHUDWH SHFSSURYW DQYQ QWKFR QBP D/Q BQQYHJUHGG RDG  
FRQWLQXHV WR LQFUHDVH +RZHYHUHQ R X UFRVWDXQG UWQB WLLQMHQWR ULV D  
FRPSHWLWLRQ WKH SUHVXUH RIDFRGO \$DHO VRV XGKILQW \$OKDKDJUHDWJQHDQ  
KDSSLQHVV RI FROODJUHVV WQIG HQMDQ QKXHQWHLURQLCHZLVU MR VWXG\ WKH FXU  
VXEMHFWLYH ZHOO EHLQJ DPRQJ VV D QHLQ W D OD BQ LX BQ J [LLW\$ JLDLFX QVFX \$DQ  
IRU WKH GHYHORS PH QWORE HLXQJMDHFRQDQ J [V XSGHQWV WUDUO 9RFDWLRQDO 8  
UHVHDFK UHVXQ VEMVHFRZL WKH D WOV KEM L'X D RJ [LV \$ XGHQW V WXUDO 9RFDWLRQ  
JHQHUDOO\ DW D KLWK DHHFRQV PHUQV WDKMFFWLYH ZHOO EHLQJ VHOI KHDO  
JUHDWHVW LPSDFW IROORZHG E\ KDPIHOW KDF W RDV WDLQPS DFW R7KH IGH WHRQV  
SURSRVHG EDVHG RQ WKH DERYH B B QXOHVS DUVX D V Q W OERZ M V W D EFKLRKQ  
FRQVXOWLQJ DJHQFLHV IRU FROODWHD Q V KIG B QV FHR SURVHDVHQB B P X Q LYDDQW  
EHWZHHQ WHDFKHUV DQG VWXGHQWV WLV KHZHHQ IEPH LQRYLQJ QWWWLQWQWLR Q  
DUH QHHGHG \$ FOHDU V\WHP VKR XSGR EHPH VQWDRDQSWKHEG W D QTC PXHQW D  
KHDOWK HGXFDWLRQ 'LVDGYDQ WFDLHM RZHDPS BRYQQJ )LV X V H QWKVH WFXE  
IDFLOLWLHV FDQ EHWWHU KHOS VFKRGRQ WVKEXIHQEG LPSULRYDQGV MRKH ZLW KH  
6HFRQGO\ WKHUH RYHBRQV IROU KIPSSHQ SUDVXG HFQ V VGV R DFXOWLHV VXF  
LQWHUYHQWLRQ LQ VWXGHQWV HPSOR\ B Q WUS B B WLRQH LDQ QW B B B QKHU  
SUREOHPV 6FKRROV VKRXOG RBDLQLHL B M OVR D Q B SUIR WHU D V XIGULFXW D P V  
(VWDEOLVKLQJ HSR WLV L P D Q D G L Q G D V D M R G Q M O R V X S F K V L W L R Q V Z L O O K H O  
VROYH VWXGHQWRE Q M P K R O R S H F D O X S H Q W V I W S D W H R Q W W F D Q K H O S W R J D  
XQGHUVWDQGLQJ BILMWDQG B QWLV F R S V U D K R R J K I F G G H R Q Q G L W L R Q V

,QWURGXFWLRQ HYHQ H[WUHPH EHKDYLRUV VXFK DV  
LQFUHDV LQJ

:LWK WKH FRQWLQXR XV GHYHORS PH QW RI WKKH JORZ D Q D B Q B P Y G X F D V  
WKH VRFLDO VWUXFWXUH KDV DFRQDQ D W HGR D Q X F W L H Q D R U P R R R Q K Q  
WKH GHJUHH RI VRFLDO GLIIHUHQW D Q W Y R Q W D V D Q F U W D G H I G W V K L S W A F K  
WKH OLYLQJ FRQGLWLRQV RI FRQ B B D W K W D X G H G R W W B I D H U J M D B W D Q C E W K  
LPSURYLQJ WKH OHYHO RI QHHG Y H D V Q I Q J R U L Q F U H D W L Q Q G 7 W K V W V Z H P  
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GLYHUVLILR B H W H H Q G X H W R W K H T X H O W L R Y Q D Y K I R W W D V H D U H V H D U F K W F  
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DFFHOHUDWH SDFH RI PRGHU QV W X G H Q W R S O H , W O D P I Q V H R R I U G L Q J V  
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VWLOO PDQ\ FROOHJH VWXGHQWV Z R Y L H Z O R X Q K D S S W D L Q G D W W H L B H D I  
DUH DOVR PDQ\ ZKR KDYH PHQW D Q D W H D Q M K H S U R H E W K P V G D Q G O R S P H Q V

#TT FRP

E\ VWXG\LQJ WKH FXUUHQW VLWXGHWLWLRQKRFRXEMHFWLJHRZHFROCEHLHQJV  
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PDQ\ VWXGHQWV FXUUHQWO\ KDYH VR  
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VWVR DQG GLILGXDVO RYHUHQWV  
DQG HFDGWLQJ ZRNOULUR DFRXW DOWXUH  
DGLWLRQ RYDSSOHUJXODWLRQDURU  
WBLDQG RYXWFKFH SUHGRPLQDWHVW  
WRODOGHSHULHQFH SUHGRPLQDWHVW  
ZHOO EHLQJ RI FROOHJH VWXGHQ  
FRUUHVSRQGLOJ GHYHORS PHQW  
FROOHJH FROOHJH

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6XEMHFWLYH ZHOO EHLQJ UHIHUVVWVFRDQGLILGXDVO RYHUHQWV  
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RWKHU DVSHFWV XQGHU WKH FROOHJH RYDSSOHUJXODWLRQDURU  
WKH UHVXOWLQJ SRVLWLYH HPRWVWRODOGHSHULHQFH SUHGRPLQDWHVW  
WKH PHQWDO VWDWH ZHOO EHLQJ RI FROOHJH VWXGHQ

)RU VWXGHQWV WKLV VWXG\ FROOHJH FROOHJH  
VWXGHQWV GHYHORS WKHLU PHQWDO KHDOWK DQG DFRXW DOWXUH  
DFDGHPLF JRDOV E\ DQDO\]LQJ WKH FROOHJH RYDSSOHUJXODWLRQDURU  
DFDGHPLF EXUQRXW DQG VXEMHFWLYH ZHOO EHLQJ DQG  
ZKHWKHU WKHUH LV D GHSHQGHQW UHODWLRQV KLS EHWZHHQ WKHP  
DQG DSSHDOV WR WKH VRFLHW\ 5HVHDFK PHWKRGV DQGLQJ RUHV  
FROOHJH VWXGHQWV PHQWDO KHDOWK SUREOHPV

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SUREOHPV RI VWXGHQWV LQ WKH FROOHJH RYDSSOHUJXODWLRQDURU  
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RI VWXGHQWV DQG SURYLGH WHDFKHUJHFXDWGHQWSUBIWXUDQJLQJ  
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ZHOO EHLQJ DV DFRXW DOWXUH RYDSSOHUJXODWLRQDURU  
ILQG RXW WKH FDXVHV RI DFDGHPLF XUDQGLQJ RYDSSOHUJXODWLRQDURU  
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SURLGH WKHRUHWLFDO EDVLV IIRWGLYHGHG YLQDWRDQGLQJ  
SUREOHP RYDSSOHUJXODWLRQDURU DFRXW DOWXUH SDUW 6XUYH\ RI WKH

)RU RWKHU VFKRROV WKURXQKRWRDWRUJHFXDWGHQWSUBIWXUDQJLQJ  
PHDVXUHPHQW RI DFDGHPLF EXUQRXWV XUDQGLQJ VWXGHQWV  
ZHOO EHLQJ LQ SUDFWLFH WKLV WKHWRUJHFXDWGHQWSUBIWXUDQJLQJ  
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ZHOO EHLQJ DQG HIIHFWLYHO\ LQWHUJXODWLRQDURU  
JUHDW SUDFWLFH RYDSSOHUJXODWLRQDURU DFRXW DOWXUH  
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DQG DFDGHPLF RYDSSOHUJXODWLRQDURU RYDSSOHUJXODWLRQDURU  
7R VXP XS WKH PHQWDO KHDOWK SURDQGLQJ RYDSSOHUJXODWLRQDURU  
VWXGHQWV KDYH DWWUDFWHG DFRXW DOWXUH RYDSSOHUJXODWLRQDURU  
WKH VRFLDO OHYHO :H PXVW SD\ DWWHQWLRQ WR WKH PHQWDO

7DEOH 7KH DYHUDQGLQJ DQGLQJ DQGLQJ DQGLQJ DQGLQJ DQGLQJ DQGLQJ  
9RFDWLRQDO 8QLYHUVLW\ RI \$JULFXOWXUH LQ IDFWRU

7KUHH	IDFWRUV	$\bar{x}$	6	/HYHO	2UGHULQJ
6FKRRO	OLIH			JK	+L
)DPLO\	OLIH				7KH KLJKHVW
6HOI	KHDOWK				7KH KLJKHVW
7RWDO					+LJK

)URP 7DEOH LW LV IRXQG WKDW WKH RYDSSOHUJXODWLRQDURU  
ZHOO EHLQJ RI VWXGHQWV RI \*XDQJ[L 9RFDWLRQDO 8QLYHUVLW\  
RI \$JULFXOWXUH LV JHQHUDOO\ DWKH KLJKHDFKUHKO UHVXOWV VKRZ W  
&RQVLGHULQJ LQWR WKUH H\WGHQDQGLQJ RYDSSOHUJXODWLRQDURU  
VXEMHFWLYH ZHOO EHLQJ VHOI RYDSSOHUJXODWLRQDURU  
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VHOI KHDOWK IDFWRUV VHOI KH...  
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GHJUHH RI LPSDFW RQ VXEMHFWLYH...  
VWXGHQWV VXEMHFWLYH ZHOO...  
FRXUVHV IROORZHG E\ VWXGHQW...  
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6WXGHQWV IURP \*XDQJ[L \$JULFXOWXUH...  
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JUHDWHVW LPSDFW RQ VXEMHFW...  
DPRQJ WKH UDQNLQJV RI VWXGH...  
KDSSLQHV DQG LQWHJULW\ SDU...  
KXQWLQJ DQG IHHOLQJ VDIH DQ...  
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WKHP  
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KLJKHVW LPSDFW RQ VXEMHFWLYH...  
LQ WKH UDQNLQJ RI VWXGHQWV...  
WKH\ DUH IXOO RI FRQILGHQFH...  
EULJKW IXWXUH DUH ZLOOLQJ...  
VRFLHW\ DQG DUH VDWLVIDHG...  
IRUJHWWLQJ XQKDSS\ WKLQJV...  
TXLPSORYLQJ VWXGHQWV VXEMHFWLYH

&RQFOXVLRQV

7KLV VWXG\ DLPV WR VWXG\ WKH...  
\*XLGHOLQH V LQ 6XEMHFWLYH...  
\*XDQJ[L 9RFDWLRQDO 8QLYHUVLW\...  
UHVHDUFK REMHFVLYHV DUH...  
VXEMHFWLYH ZHOO EHLQJ RI...  
9RFDWLRQDO 8QLYHUVLW\ RI...  
JXLGHOLQH IRU GHYHORSLQJ RI...  
VWXGHQWV LQ \*XDQJ[L 9RFDWLRQ...  
\$JULFXOWXUH LQ...  
DFFXUDWHO\ WKH VDPSON JURXS...  
WKLUG \HDU VWXGHQWV RI...  
8QLYHUVLW\ RI...  
VWXG\ LQFOXGH TXHVWLRQQDLUH...  
GDWD E\ ILQGLQF...  
DQG VWDQGDUG GHYLDWLRQ...  
UHVXOW DQDO\VLV...  
DUH DV IROORZV  
7KH UHVXOWV RI WKLW VWXG\...  
SXUSR VH RI WKH UHVHDUFK...  
DQG PHDQ DQDO\VLV RI WKH...  
IDFWRUV IDPLO\...  
IROORZLQJ WZR FRQFOXVLRQV...  
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\$JULFXOWXUH 9RFDWLRQDO 8QL...  
OHYHO JURP WKH WKUHH GLPHQ...  
ZHOO EHLQJ VHOI KHDOWK IDFW...  
IROORZHG E\ IDPLO\ IDFWRUV...  
OHDVW LPSDFW  
6WXGHQWV DW \*XDQJ[L \$JULFXOWXUH...  
8QLYHUVLW\ EHOHYH WKDW VFK...  
GHJUHH RI LPSDFW RQ VXEMHFWLYH...  
VWXGHQWV VXEMHFWLYH ZHOO

LQGLFDWLQJ WKDW WKLW IDFWRU LVKDQLDWDHDXWKDWSFRLOVHUBVDWXGHS  
 QHHG WR IRFXV RQ JURP WKLW SHXWSEHFWLY\$ 7DV XQLYHUVWODWLR  
 DGPLQLVWUDWRUV ZH VKRXOG SD\ FROOHJH VWXGHQWLV RQ XEMHFVLYH WHV  
 IDPLO\ VLWXDWLRQV HVWDEOLVKODPLF KRPDUGLQRJGFKRRO ODO  
 FRPPXQLFDWLRQ PHFKDQLVP DQG SGRPSON\FHDDWVWKH ±  
 SV\FKRORJLFDO IDFWRUV DIIHFWLQJ VWXGHQWV GRH3 WR KRORJ\ RI 4X  
 VLWXDWLRQV \$V WKH VWXGHQW PDQDJHPHQW GHSDUJW DQG RVLWLY  
 FROOHJHV DQG XQLYHUVLWLHV WKHGHVWDFORJLQWVWKH ZZZ VS  
 LQVWLWXWLRQ LW VKRXOG IRFXV RQ WKH SHRSOH ZKR KDYH WKH  
 DELOLW\ WR PDQDJH VWXGHQWV PHQWDO KHDOWK HGXFDWLRQ  
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 UHVSQVLEOH IRU VWXGHQWV DQG FROOHJHV GHVWDFORJLQWV WR  
 VWXGHQWV RI /DXJKWHU 7KHUHS\ ODVWU

\$OWKRJK VFKRRO OLIH IDFWRUHGDFDQ80LYWUWVW\ DOVR  
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)XWXUH 5HVHDFKHV

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 PRUH GHWDLOHG VXJJHVWLRQV DQG VWUDWHJLHV IRU LPSURYLQJ  
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5HIHUHQFHV

'HQJ -LQJ 5HVHDFK RQ WKH 5HODWLRQV KLS  
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 ) HV:IOVQJ</S&%8\ ( XQLSODWIRUP 1=.37  
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